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DEVOTED TO THE INTERESTS OF

ILLUMINATION, HEATING, MECHANICAL, CHEMICAL

AND

GENERAL SCIENCE.

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(FIFTIETH YEAR.)

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BRIEFLY TOLD.

FIRST ANNUAL MEETING, CANADIAN GAS ASSOCIATION.—If there ever was any doubt that the organization of the Canadian Gas Association was to be attended with a full measure of success such doubt was completely dissipated by the proceedings of the first annual meeting, which was fittingly held in the commodious assembly room of the handsome and well-managed King Edward Hotel, which modernly arranged edifice, both as to its exterior and interior, would do right good credit to a corner on Broadway, anywhere above 34th street, this borough. The meeting was promptly called to order at 10 A.M. of the 26th ult., by the President, Mr. H. H. Powell, of Brantford; and a right good presiding officer he proved. At the outset much cause for sorrow and sympathy was found in the lamentable fact that, owing to a sudden attack of illness, the Secretary, Mr. A. W. Moore, of Woodstock, was unable to take the recorder's desk. This was all the more regrettable from the knowledge that his best reward, in connection with his yeoman's work during the preliminary period, or the reward that would have pleased him most was at hand in the abounding success of the sessions. However, his is the satisfaction that the work of the Secretary *pro tem.*, Mr. F. Burnett, of Toronto, was flawless. The President was beaming with satisfaction (and so were the faces of "Charlie" Forbes, J. C. Hay, of Listowel, W. H. Pearson, of Toronto, E. J. Philip, of Berlin, and W. C. Kennedy, of Windsor, all members of the Executive Committee), to say nothing of the countenances of Vice-Presidents Norris and Keiller, at the amazing attendance which confronted him. The executives hoped for 25 in attendance; they had 60. That is enough to say as to whether the new child was to grow lustily. The call to order was followed by the reading of the minutes of the organization meeting and the respective reports of the Executive Committee and those from the Treasurer-Secretary. These satisfactorily disposed of, the Committee on Nominations presented its recommendations for suitable office bearers for the following year, and in short order the following gentlemen were declared elected:

Honorary President.—Mr. H. H. Powell, Brantford.
President.—Mr. J. C. Hay, Listowel.
First Vice-President.—Mr. J. S. Norris, Montreal.
Second Vice-President.—Mr. W. H. Pearson, Jr., Toronto.
Treasurer and Secretary.—Mr. A. W. Moore, Woodstock.
Executive Committee.—Messrs. E. J. Philip, C. Forbes, J. Keillor, C. P. King and P. S. Coates.

The President's address (and a really good one it was), which dealt in up to-date fashion with matters that are just now appealing to gas men in the States as well as to those in the Dominion, having been properly disposed of, a slight recognition of his services, in the way of a money payment, was passed to Secretary Moore, after which President-elect Hay addressed the convention on a topic that appealed seemingly to everyone present. His theme was coal shortage in car deliveries, and at the conclusion of his forceful remarks the following resolution was put through with applause:

"Moved by Mr. E. J. Philip, seconded by Mr. Charles Forbes, that, having heard the report of the action taken by the Retail Coal Dealers' Association, in the matter of short weights of coal in car lots, we, as an association of gas manufacturers and large users of coal, approve of all steps taken by the Retail Dealers' Association in bringing that all-important question before the Dominion Railway Commission; and, with a view to giving our practical aid to this work, we recommend the executives of this Association to recognize this work by a grant of $50 to assist in the completion of it before the Railway Commission."

Then came a very interesting paper, by Mr. J. Keillor, of Hamilton, on "Coal Tar and Ammonia." The paper led to a brisk discussion, which ended in a resolution recommending the executive officers to continue their efforts to prevail upon the Dominion Government to remove the duty on coal for gas making purposes coming into Canada, and to place a duty on the by-products in gas manufacture. The Association then declared a recess, to terminate at 3:30 P.M., the interim to be devoted to a visit to Hiawatha Island, there to enjoy the hospitality of the Royal Canadian Yacht Club, the present wonderful standing of which as hosts, club men and sailors, is largely due to the persistence, cleverness and heartiness of Mr. W. H. Pearson, Jr. The day was perfect (in fact, all through the meeting the weather conditions were superb) and it would puzzle many a voyager to name a spot that looked more glorious than did Hiawatha Island the afternoon of the 26th ult. And as the day was so was the hospitality of Mr. Pearson and his associates. Indeed, we fear that, with the inspection leisurely made of the Club's beautiful and effective properties of every sort, the bountiful luncheon that followed and the picture taking that concluded the visit, many would have preferred to remain on the Isle de Hiawatha. However, business was promptly resumed in the King Edward, at the hour appointed. The first thing in the afternoon session was the reading of a letter of regret from Mr. W. H. Pearson, Sr., that grand dean of his profession in Canada, and whom the States gas men have honored with every promotion in their gift, regretting his inability to be present. The first set paper for the afternoon was that by Mr. Pearson, Jr., on "Producer Gas Fired Benches," which led to a good discussion. "Gas Appliances," by Mr. J. C. Forbes, then held the floor, after which came the number by Mr. E. J. Philip, of Berlin, on "Producer Gas for Power Purposes." We noted that while the au[illegible] spoke in favor of such apparatus for

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moving engines beyond 50-horse, he was not at all enthusastic about their utility on anything under 50. Quite a number agreed with him too in the latter respect. The set programme next called for the paper on "Experiences with Canadian Coal." In the absence of the author it was read by the Secretary, and was not discussed. The recitation by Mr. L. S. Bigelow, on the "Commercial Side of the Industry," closed the regular technical programme. The evening was spent most enjoyably at Scarboro Beach, which is to Toronto as Coney Island is to New York. And the visit was made at the invitation of the Consumers Gas Company and of the Economical Gas Apparatus Construction Company, who, in fact, were our generous, ubiquitous hosts the whole time. And royal hosts they were. Saturday morning a huge touring automobile carried 46 to the existing working station of the Consumers Gas Company. The plant was thoroughly inspected, and its many divisions are all to the good. Human labor is dispensed with wherever such dispensing could be made, and the cleanliness of it all was amazing. It may be invidious here to single anything out, but Master Mechanic Jeffer's ears must have been tingling good and hard as he perforce listened to the encomiums passed upon the machine shop. Another ride brought the party to the magnificent new works of the Company now well along to completion. As we propose to describe these in detail at an early date, we will take leave of the matter here with the remark that no other city in the world will have a completer or more modern gas works. Planned by Pearson, Sr., and his staff of engineers, constructed by Mr. G. A. Bronder and his associates, under the supervision of the go-ahead Pearson, Jr., and abetted by the clever financiers of the Company, the works will be a monument to their harmony of thought and action that will result in general benefit to the gas industry of All-America.

Another thing in connection with the meeting was the appearance of the initial number of "The Gas Journal" of Canada, which, as its title page asserts, is to be issued monthly in Toronto, and to be devoted to progressing the interests of gas light, heat and power. It is good looking in get-up and typography, and was of much assistance to the Association in many ways. We wish to express our obligations for courtesies received to its Editor, Mr. H. M. Mosdell.

SPECIAL EDITORIAL CORRESPONDENCE, VIA BRAZIL, S. A.—"Early last April press despatches from Rio Janeiro, Brazil, conveyed the information that labor was very unrestful in Rio Janeiro generally, and that that concerned in the manufacture and distribution of gas and electric currents was especially so. Hardly had the premonition been forwarded than came the news that the employees of the 'Societe Anonyme du Gaz de Rio de Janeiro' had not only quit their posts, having abruptly demanded higher wages for fewer hours; but failing their demands' satisfaction, without warning they visited the works and, before they were quelled, had done much physical damage to the plant. You folks in the States, and particularly the residents in New York, concerned in gas making, have had many hard raps, especially in the instance of the famous —or otherwise - 80 cent gas law rate for New York and Brooklyn boroughs, but your recourse was to law, not to a physical attack upon your liberal (?) Governor and his Senators and Assemblymen. To show you, though, how much use there would be here—and without foreign capital and without foreign brains and brawn this place would only be a wallowing spot - in appealing to the law I forward you the inclosed 'A Noticia,' which was put out on every available place in the city, which precious document bears the signature 'M. A.,' and these are the initials of Madinas de Albuquerque, a prominent figure in the National Brazilian Congress.'

A translation of the notice is appended.—EDS.

"*Order of the Day.*—To the employees of privileged undertakings, enjoying franchises, only one advice can be given; calm advice it is prudent and meditated, which is this: Never stop at striking only, whenever in need of protesting against some extortion, commence by destroying the machines, apparatus and buildings of these undertakings. It may be said that this advice, given as very moderate, is, to the contrary, subversive and revolutionary; but there is injustice in that estimate of it. When there is no legal means of forcing one's rights, only one resource is perfectly recommendable—violence. It is nevertheless precept of law to be allowed to oppose force by force; nor does it make any difference as to the manner in which this force is employed.

"Thus, what the gas employees should have done was to destroy retorts, gasholders, piping, etc. Certainly, this would have caused us, good, quiet citizens, great damage. However, in this case it is not of the employees but of the Government that we would have (yes, that we now do) to complain, since it is the Government that drives the employees to select which horn of the dilemma as shall be clinging point.

"At this moment, for instance, we notice that the employees, for desiring to act calmly and within the law, are going to be once more sacrificed to an omnipotent undertaking, which laughs at the people, laughs at the Government, laughs at every one in this Capital. The case is explained in the morning papers. We have in them the disposition of the two forces—the workmen and Mr. Mackenzie.

"The Gas Company has broken the law for quite a while. By the 10th clause of its contract it is obliged to manufacture daily all the gas needed for the lighting of the city, plus 15 per cent. But its holder complement is not sufficient for this; and here is, therefore, sufficient cause for the withdrawal of its franchise. But not only is it not withdrawn, nor does the Company get even the least notice to that end, but is quietly waiting for the moment when it may obtain from the Government the right to sell for fantastic prices the kilowatt hour of electric light which the same Government knows costs the Company but 25 reis. With the purpose, however, of at least furnishing the gas strictly necessary for daily consumption, now that the cold weather is beginning, the Company decides to force the manufacture, raising the pressure in the retorts and requiring from the workmen superhuman efforts. The employees maintain, and it is moreover the truth, that those retorts and other apparatus are working along almost by a miracle. There is at any moment the danger of an explosion of the apparatus. If to morrow such a thing were to happen, after attention was called thereto, and if through it any employee was killed, the question arises, 'Will it not be an act of perfect justice that any of the victims' relatives cause also an explosion on their own account, and make attacks against the authorities who allowed such things?' Without any doubt. But till we come to that extreme—which will be lamentable, but not reproachful, as it will only represent the just vengeance of the oppressed, who have none to whom to appeal—the situation is the crux that we are observing. The Company demanded of its employees one-half additional to the work they did, proposing to pay one-ninth more salary. Naturally the men did not accept; they could not do so! With the certainty above all of a man accustomed to ridicule inspectors of illumination, ministers, city mayors and Presidents of Republic. Mr. Mackenzie (head of the Gas Company) explains to-day that the thing was entirely optional. Only those who might desire to would earn the supplementary hours, and with an air of false innocence, while inwardly he is amusing himself at our expense, the Director of the lighting monopoly expresses surprise that the proposed favor be rejected, and that the men go on strike against him and his Company.

"But that which he does not state is that the employees who did not want the *voluntary*, optional and gracious raise of ⅓ the work for ⅓ the wage would be dismissed and replaced by others. It is perfectly clear that if the Company has to pay so much to the employees who charge 98 kilos, it could not find anyone who, for a milreis, would charge 47 additional, with which it was desired to increase the work of its employees. The said voluntary, optional and gracious demand was, therefore, a violent and odious imposition. However, Mr. Mackenzie did not mind making it, for the greatest peril he ran was that of a strike, and the strike is really beneficial to him. Since it is in force he has at his call and beck, right in the works, soldiers, firemen and marines, with, in addition, and at the same time, orders from Sao Paulo for all the additional personnel that he needs. This is mainly the standing of our observation.

"It is convenient to say that the intervention in this particular case (which is a case of public safety) of government personnel to the manufacture of gas could be justified; but it could have been justified if the Government began by doing its duty, through rescinding the contract due to the 10th clause. A strike fomented by the undertaking itself cannot be called a case of force beyond its control. As the Government does not interfere in the determining of salaries, it has no concern whether the Company or the employees are in the right. As long as the Government assures order, guaranteeing to the workmen with whom the undertaking may propose to contract, it has not to go into the question of the motives due to which it could not get workmen. Since it, enjoying all safety, did not manufacture the quantity of gas which it was obliged to, its contract has become invalid. Wherefore, one may see that this custom of loaning soldiers for the service of foreign speculators is absurd. Let us take the hypothesis that to-morrow the light company would decide to pay only $1 a day to its employees. Naturally it could not employ any. Would the Government have to furnish the personnel because it was a case of force beyond the control of the Company? Admitting these late happenings as normal the latter would seem to be the case.

"Some may say this is a fantastic hypotheses, as the payment would be obviously insufficient. The question is, however, one of principle. If the Government may think that $1 is not sufficient, it may also think that $8 is also not satisfying; but if it is deprived altogether of the right to interfere in the question of price, the only right given to it would be that of furnishing Brazilian soldiers to work under the orders of foreign speculators, whenever these may desire to lower the salary of their employees? And nothing marks the limit to these reductions. The Government cannot appreciate the justice of the employees' complaints, but it takes, however, the responsibility of loaning soldiers, firemen and marines, so that a corrupting and omnipotent undertaking may oppose the employees at will. Under such conditions one can well see that only one resource remains to the employees of these undertakings. That is this: Whenever they desire to obtain anything, begin by destroying plant, machines and apparatus that it may not be possible for the Government to add its oppression to the oppression of the bosses. At this hour, Mr. Mackenzie has everything he desires. He will substitute the workmen on strike by others and will continue to have at his call all the official complicity necessary; and he will continue to disrespect a contract, through which he enjoys all favors, but concerning which he does not submit to any burdens whatever. Furthermore, this old sport amuses himself at our expense with sarcastic articles of great mirth and of superior irony."

Judging from the foregoing, Rio de Janeiro in particular, and Brazil in general, are not the most likely places on earth wherein to advise American investors to engage in the development of public utilities.

Street Lighting Statistics in New York City for the Year 1908.

Through the courtesy of the Hon. John H. O'Brien, Commissioner of the Department of Water Supply, Gas and Electricity, New York city, we give below statement covering street lighting conditions for the present year.

The bids on contracts which are made for 1 year beginning January 1st, have been on file for some time, but the city refused to accept the prices made on some of the items; concessions were made by the companies and the final awards are given in Table I.

The number of arc lamps under the New York Edison Company's contract passed the 5,000 mark during 1907, and some 500 lamps are now supplied at $95. As the number of lamps increase, the price decreases in regular steps.

The prices given for gas lamps cover the entire expense so far as the lamps are concerned; but there is an additional expense attached to gas lighting, for the city supplies the posts and the contractor's charge for erecting, repairing and painting them. The price covering the supply of gas is now in litigation.

The bids covering repairs in Manhattan and the Bronx were made by the Consolid ted Gas Company; in Brooklyn by the Brooklyn Union Gas Company; in Queens by the Newtown Gas Company, Richmond Hill and Queens County Gas Company, Jamaica Gas Light

TABLE I.—*Street Lamps Burning January* 1, 1908, *New York City, with Prices for the Year* 1908.

	Electric Arc.								Electric Incandescent. Carbon.		Electric Incandescent. Tungsten.				Gas.† Open Flame.		Gas.† Mantle.		Naphtha. Open Flame.		Naphtha. Mantle		Total.
	500 Twin.		450		400		325		90-100		54		81* Watt.										
MANHATTAN.																							
N. Y. Edison Co.	208	$130	3,499	$100	...	...	24	$90	143	$25.50	..	$22.50	..	$30	....	....	....	....	..	....	...	....	....
United Elec. Lt. & Power Co.	...	....	255	100	..	....	....	...	4	22.50	..	....	..	.	...		....	....	..	....	....	....	....
Welsbach St. Ltg. Co.	..	..	....	....	...	....	..	...	....	....	..	...	..	...	75	$6	15,425	$12.00	..	....	1,119	$28.20	....
Total	208	....	3,754	...	.		24	...	147	....	..	...	.	...	75	..	15,425	....	..	....	1,119	....	20,752
BRONX.																							
N. Y. Edison Co.	...	...	1,297	100	..	....		...	374	25.00	..	25.00	..	32	....	..	....	....	..	....	...	....	....
Westchester Ltg. Co.	..	....	258	100	...	...	...	..	16	....	..	....	..	..	...	..	....	....	.	....	...	....	....
Bronx Gas & Elec. Co.	...	...	....	....	760	$105	..	...	..	....	..	...		...	...	..	....	....	..	....		....	....
Welsbach St. Ltg. Co.	...	....	....	.. .	.	..	....	...	....	....	..	....	..	...	88	6	5,992	12.00	..	....	1,888	28.20	....
Total	...	.	1,555	....	760	..	..	...	390	...	..	....	.	..	88	....	5,992	12.00	..	....	1,888	....	10,673
BROOKLYN.																							
Edison Elec. Illum. Co.	.	..	4,214	100	...	...	211	90	....	....	..	....	.	...	....	....	....	....	..	....	...	....	....
Flatbush Gas Co.	...	...	806	97	...	...	....	...	...	....	..	....	..	..	....	.	....	....	..	....	...	....	....
Brooklyn Union Gas Co.	...	..	....	....	...	..	...	...	..	....	..	....		..	2	*	...	....	..	....	....	....	....
N. Y. & N. J. Globe Gas Lt. Co.	...	..	....	....	...	..	....	...	....	....	.	....	..	..	....	..	17,739	13.32	12	$22.50	....	....	....
Welsbach St. Ltg. Co.	..	....	....	...	..	..	...	...	...	....	.	.. .	..	..	....	...	...	....	.	..	656	28.20	....
Total	..	...	5,020	....	..	....	211	...	..	...		.. .	.	.	2	..	17,739	....	12	....	656	....	23,640
QUEENS.																							
N. Y. & Queens Elec. Lt. & Power Co.	...	....	....	..	...	....	2,149	90	146	25.00	92	25.00	..	33	....	....	....	....	..	....	....	....	....
Queens Borough Gas & Elec. Co	...	....	....	....	...	....	249	90	23	25.00	..	....	..	...	....	..	....	....	..	....	....	....	...
N. Y. & N. J. Globe Gas Lt. Co.	...	....	....	....	...	....	...	...	...	....	..	....	..	..	. ..	..	4,310	13.98	..	....	....	....	....
Welsbach St. Ltg. Co.	...	....	....	..	..		...	..	....	....	..	...	..	...	....	..	..	...	..	....	690	28.20	.. .
Total	...	..	....	....	..	...	2,398	...	169	....	92	....	..	...	...	...	4,310	....	.	....	690	....	7,659
RICHMOND.																							
Richmond Lt. & Ht. Co.	...	....	664	100	..	...	...	...	3,933	25.00	.	....	..	...	....	....	...	....	.	....	....	....	....
Total	...	...	664	....	..	..	...	..	3,933	....	..	....	..	...	....	....	....	....	..	....	....	....	4,597
Greater N. Y. Totals	208	...	10,993	....	760	..	2,633	...	4,639	..	92	....	.	...	165	....	43,466	....	12	....	4,353	....	67,321
	Total Arcs, 14,501. * $95 for each lamp over 5,000.								Total Incandescent 4,371. *To be installed.						Total Gas 43,631. † Price only covers maintenance. * No maintenance.				Total Naphtha 4,365.		Free		185 67,506

On January 1, 1908, there were 67,321 regular and 185 free lamps, these latter consisting of 171 arcs and 14 incandescents.

The bid covering maintenance of mantle gas lamps was $12.50 per year and the final price $12, the same as last year.

In Queens and Richmond the bid was $14.50 per year and the final award made at $13.98, same as 1907.

In 1907 the prices of naphtha lighting were $20.88 for open flame and $27.24 for mantle. In 1908 the bids were $24 and $29, respectively, and the final award $22.50 and $28.20. The increased price of this style of lamps is only temporary as they will be replaced as far as possible this year by either gas or electric lamps.

The price of electric lamps remains substantially the same as last year, the only changes being the following reductions: Bronx Gas and Electric Company, 400-watt arcs, $107.50 to $105 per year. Queens Borough Gas and Electric Company, 90 100-watt incandescent lamps, $35 to $25.

TABLE II.—*Price of Repairs to Gas Lamp Posts, New York City,* 1908.

	Erected.	Lamp Posts Removed.	Lamp Posts Reset.	Lamp Posts Straightened.	Columns Refitted.	Columns Reheaded.	Columns Recaulked.	Service Pipes Refitted.	Stand Pipes Refitted.	Lamp Post Reset to Grade.	Lamp Posts Painted.
Manhattan..	8	$3.50	$8.00	$1.50	$3.50	$2.50	$1.00	$5.50	$2.50	$5.00	$.20
Bronx	8	3.50	8.00	1.50	3.50	2.50	1.25	5.50	2.50	5.00	.25
Brooklyn ...	10	3.50	10.00	1.50	3.50	1.50	1.50	4.00	4.00	5.00	.20
Queens.....	10	3.50	10.00	1.50	3.50	1.50	1.50	4.00	4.00	5.00	.20
Richmond ..	12.50	5.00	12.50	1.50	3.50	2.50	1.50	8.00	4.00	5.00	.30

Company, Woodhaven Gas Company, and the New York and Queens Gas Company; in Richmond (Staten Island) by the New York and Richmond Gas Company.

These prices are the same as in 1907, with the exception of New York and Queens Gas Company, where a reduction was made on 7 items. Lamp posts reset to grade is a new item.

All of the prices are based upon a time table of 3,962.05 burning hours for 366 days, or a leap year, with *pro rata* deductions for outages.

[Official Report.—Continued from Vol. LXXXVIII., Page 1107.]

PROCEEDINGS, SEVENTH ANNUAL MEETING, WISCONSIN GAS ASSOCIATION.

Held in Milwaukee, Wis., May 14 and 15, 1908.

First Day—Evening Session.

Speech of the President of the Wisconsin State Railroad Commission (Prof. B. H. Meyer) at the Banquet.

At the banquet, which was held in the Athletic Club, Milwaukee, Thursday, May 14th, Mr. Douglas acted as toastmaster and Prof. B. H. Meyer, Chairman of the Railroad Commission of Wisconsin, made the following address:

Prof. Meyer—Mr. Toastmaster and Gentlemen: My remarks will be very brief and fragmentary. A few weeks ago, in an argument before the Commission, a representative of one of the utilities made the statement that the enactment of the law of 1907 marked a new era in the history of the utilities in the State of Wisconsin. If that is true, and I think the gentleman stated it correctly, we find the characteristics of that new era not in many of the provisions of that law, not in the Commission, which was given certain powers with respect to the public utilities in the State, nor in the character of the business itself, but rather in the conditions under which the business is conducted in this State in the future. Under the provisions of that law you gentlemen who represent the companies will continue to act in your respective capacities as you have acted theretofore. If anyone had an idea that the Commission was desirous of becoming a general manager of the gas and numerous other companies in the State, I trust you will all disabuse your minds of that idea. The Commission has no such aspirations and has no such desires, and luckily the law does not require it; but if it did we would all agree that the law was a very foolish law if it required any such thing. Under the law you will continue to be the managers and custodians of your respective properties. The law does, however, lay down certain general rules and principles which, in a measure, may be said to introduce so many new features into the conduct of the business that a new era has set in. Now, as I see it, one of the main characteristics of that new era is the compulsory promotion of business methods in the conduct of all the utility enterprises in the State. No doubt all of you are conducting your enterprises on a thoroughly sound business basis, but the other fellow, who does not attend the convention, may not necessarily do so, and among the gas companies there may be no representatives of that kind, but among some of the other utility companies there may be those [laughter] who do not conduct their business upon a thorough business and professional basis. The law promotes thorough business methods and in a sense compels them. One of the first little matters that came before the Commission under the law I think illustrates that. It was not a gas company. The proprietor of that particular establishment happened to be operating two different utilities, and he made some application which incidentally involved an advance in some rate, and before that advance could be granted under the law, he had to make his statement as to why he wanted the advance, etc., and before the Commission could reach a conclusion in respect to his application it felt that it was necessary to ascertain something about the amount of his investment, the amount of his expenses, etc. The engineers did their part of the work and the accountants theirs. When our investigation was concluded it was found that this man, who had about $15,000 in round numbers, in one branch of his enterprise, was making a scant 4 per cent. on his investment, not counting anything for depreciation or personal services; and in the other branch, with approximately the same amount of investment, without putting anything aside for depreciation or personal services, he had less than $150 to show for his year's work at the end of the year. I would not invest in that kind of a utility if I had anything to do with it; but perhaps you would. [Laughter.] Now I think that illustrates one of the results that the law is bound to bring about. Here was an enterprise in a small town conducted on a basis that none of you would characterize as a good business basis, and possibly the owner of that establishment did not know just where he was standing. We hope that what the Commission did in that case assisted him in finding a proper business basis, because the people of the State of Wisconsin, I am sure, do not want any man to invest $15,000 in a branch of the public utility business and devote his personal services, put aside nothing for depreciation, and have less than $150 net to show for it at the end of the year. There are many features of the public utility business that have been brought to the attention of the Commission, and I am thoroughly convinced that the Commission can be of real service to the people of the State of Wisconsin in placing at their disposal the higher standards of the public utility service. The Commission is anxious that the most up-to-date method should be adopted, that the service should be improved in every way possible, that every improvement that may be offered to you, if it is practicable and desirable and in the interest of the consumers and producers alike, shall be adopted, and the Commission will gladly welcome all such improvements and take all these things into consideration when such cases as are bound to arise come before the Commission for consideration. It is in the interest of the owners and managers of these utilities, as well as in the interest of the consumers, that the greatest possible progress should be made in every branch of every one of the utility enterprises in the State. The accounting features of the law I am sure have received a great deal of attention at the hands of our friends the accountants here, and when forms of accounts have finally been adopted, and the statistics therefrom have been compiled, we hope that these statistics may be of real assistance to many of the utility enterprises in the State. Not all these enterprises are capable of maintaining these special features and departments with highly trained experts, and by adopting uniform methods of keeping the accounts it will be possible for the smaller companies to get the benefit, in a way, of the experiences of the larger companies, and for each company, large or small, to make comparisons and draw inferences leading to its own business advantage. Now, as things are to-day, you gentlemen establish your standards of service, you provide that service, your judgment decides as to whether or not that service is the service that is best adapted to your plant and the community in which your plant is located; you establish your rates to fit the particular conditions under which you provide consumers with whatever you do provide—in this particular case with gas. You are the ones who still have the sole responsibility. Before the law that was true, and it is as true now as it was then. But as you all know, if a service or a rate is challenged, the matter comes before the Commission for consideration. It is the idea of the Commission that whatever facts bear upon any particular matter that may come before it shall be thoroughly gone into and shall be thoroughly considered, not as a matter of litigation, not as a matter of controversy or conflict, but as a matter of calm consideration and investigation. When these questions arise we must consider them carefully, must interpret the facts, and all of us endeavor to outline a course of action that shall remove the cause of friction, if friction there was, in order that he may proceed along lines that will be satisfactory to the producers as well as to the consumers. I know that some of the gas men and other utility men outside of the State of Wisconsin, perhaps, have had some apprehensions about the effect of all this upon investments, etc. I wish to say to you that every dollar that is invested in the public utility enterprises of this State will be recognized by the Commission, as it ought to be recognized, in fairness, irrespective of any legal provisions; and the investor who has put his money into an enterprise of this sort, who has invested it in good faith with reasonable care and under the direction of reasonably able men, will receive the same protection - in so far as the Commission can offer protection—and the same support that the individual receives who may have a just cause for complaint. The Commission hopes that investments in Wisconsin utilities will become increasingly attractive. It is the duty of the Commission, and the only duty of the Commission, to stand on whichever side, in the light of all the facts before it, the right lies, as nearly as the right can be ascertained in each particular case. And you will find, gentlemen, I hope, without exception, that the Commission will be with you, even if 50, 75 or 100 per cent.—if such a case is conceivable—of your consumers are against you, if you are right, the Commission will be with you as long as you are right, and what is right may sometimes be a difficult matter to determine, but if we sit around a table and talk things over and get at all the facts, there ought not be a very great difference of opinion as to what is or is not right. The Commission wants to be as

useful as possible in every way, and in connection with every phase of the business. I hope that the offices of the Commission may become a clearing house for all sorts of useful information with respect to the utility enterprises of this State. The Commission is acting now as an intermediary in many instances. A letter comes in with respect to the service in a certain community, the Commission at once sends the letter, or a copy of it, to the manager or the owner of the particular enterprise in question, and the manager makes his explanation and the Commission transfers that explanation to the person who makes the complaint. Very often these little difficulties are the result of a lack of understanding, and by getting at all these facts in the office of the Commission, tabulating, formulating, interpreting, commenting on them, and placing them at the disposal of every citizen in the State of Wisconsin, we hope that the Commission may be the means of spreading intelligent views with respect to the conduct of these enterprises. There are many things about these enterprises that are purely technical and that only the experts in the business, like the gas engineers, can understand; but there are many other things, and especially those things that directly affect the public, that every man with a reasonable degree of intelligence can understand. Now, if you gentlemen will contribute without reserve the necessary facts with reference to your business interests and place them at the disposal of the Commission, the Commission will see that this information is interpreted, forwarded and distributed among the people of Wisconsin, in order that they may get a correct and a comprehensive view of the conduct of your business. And this suggests one thing that I would like to emphasize more than any other in respect to such matters as may in the future come before the Commission regarding the enterprises with which you are connected, and that is that you will, if you please, come to the Commission with absolute frankness and state the facts. We have nothing to conceal, and I know if you think about it carefully, as doubtless all of you have, you will find that you have nothing to conceal, and that nothing but the absolute facts will meet the situation. We want the facts and all the facts, and if a certain statement can be expressed by 7.3, let us have it 7.3 when we start, and not when we end. Let us not begin with a statement that it is somewhat more than 3 and somewhat less than 50, and then have a see-sawing process between 50 and 3 until we get to 7.3. If you know it is 7.3 we should like to have you say it is 7.3, so that we will know it is 7.3; and if 7.3 is the thing to stand for, the Commission will stand for it, and stand back of you no matter what the opposition may be. I hope and I am confident that that can be done. I hope that with this absolute frankness of feeling between the Commission and the utilities, in the first place a correct understanding can be arrived at between the Commission and yourselves, and that, therefore, the public may be correctly informed regarding all those things which may lead to misunderstanding and prejudice and very often foolish or at least useless complaint. I know very well that you gentlemen, as responsible officials of these enterprises, desire the good will of your constituents. No man desires to encounter illwill, and if illwill has here and there appeared, I am sure, with an explanation showing that the existence of things complained of is proper, if it is proper, that the people will be satisfied, and they must be satisfied, because whatever is right must stand, and that is the only thing that can and will stand. Now, gentlemen, I am very sorry my colleagues of the Commission are not able to be here this evening. I am sure they might have contributed some things representing their points of view, and that you would have enjoyed having them here. We appreciate very highly your courtesy in asking the members of the Commission and the engineering staff to attend this meeting and this banquet this evening. We appreciate very highly your courtesy in extending to the members of the engineering staff the privilege of participating in your meetings. I thank you for your attention. [Great applause.]

Speech of Mr. John I. Beggs.

Mr. Beggs—Mr. Toastmaster, Guests and Members of the Wisconsin Gas Association: I appear before an assemblage of experts in the gas business with some embarrassment, as my advent to that line of public utilities dates back a much shorter number of years than it does in the electrical branch of public utilities—that is, electric lighting and electric railroading; and as I sat here to-night and enjoyed the mirth, I could not help but think of the difference between that subtle fluid with which my earlier years in the public utility business was associated, and that of yours. It is very evident to me, with my limited knowledge of the gas business, that your holders were filled before you left home, and it does not make any difference even if the stokers possibly had gone out, that gas is still flowing through the meters with the same rapidity as if you were there. [Laughter.] In the electrical branch of the business we never feel entirely comfortable when we are away from headquarters. We know that the possibility of a short circuit may shut down both the electric lighting plant and the electric railway, and, therefore, we do not as a general rule have that joyousness which is evident here to-night, and which is such a pleasant change from the serious associations I have met with in the last 25 years in public utilities. It is very good indeed to be here in this buoyant gathering; elevated, as it were. You are the people, or at least we are the people, and my genial friend here on my right (Mr. Douglas) and the gas company that I have the honor of serving in one of your Southern cities, was the first to supply the buoyancy which gave to us the first great balloon race in this country, the Laclede Gas Light Company, of St. Louis. It is very gratifying, indeed, gentlemen, to find here fraternizing together the representatives of the Railroad Commission of the State of Wisconsin, to find here their technical experts, selected with the greatest care, professors with reputations back of them that command respect both as to their ability, qualifications and conscientious efforts to arrive at what are proper standards to be adopted by the various companies that we represent, as well as on the other hand, the valuation staff that is identified with this Commission, as well as with the Tax Commission of the State, and to feel that we can mingle together, exchanging our views, getting this expression of opinion and of the principles that govern the deliberations of that Commission from its honored Chairman here to-night, knowing as we do, those of us who have studied this business both from the technical and the commercial side, that every evidence we have had from these experts that have been selected with so much care by this honorable Commission indicate their intent to be fair and recognize the other side of this serious problem. To me, representing as I do, so many of these interests in the State of Wisconsin, it is a source of satisfaction to feel that these investments are at last about to be safeguarded by intelligent supervision, by intelligent regulations, because intelligent and honest regulation means proper protection, and that is what this class of properties throughout this country needs to-day—no favors. None of these companies honestly administered need any favors at the hands of the Railroad Commission of the State of Wisconsin or the Interstate Commerce Commission or any other commission. They do need to be fairly represented to the people of this country—not misrepresented day after day by a prejudiced press, catering to public clamor, catering to demagogues and supplying ammunition for demagogues to use before legislative and municipal bodies. That is what we are suffering from, gentlemen. That is why it is that scarcely a corporation in this broad land to-day can sell a security at anything like its real value. It is because of the distrust that has been engendered by this unjust, prejudiced clamor by designing politicians, whose whole capital is their denunciation of success. It is deplorable to think that we have drifted into a period of this country's history when to have sufficient brains, energy, industry and economy to accumulate something, is a crime in the eyes of a great mass of the people. It is unfortunate, gentlemen, and I am not here to defend much that has been done. Much that has been done by the administrators or these corporate interests throughout this country is highly censurable. No doubt some of it was criminal, but that percentage is even smaller than is shown in the instance of the one disciple who proved recreant. There is no reason why we should all be condemned unheard, and it is this Railroad Commission that gives us the opportunity of being heard. They are the people's tribunal before whom we can come. We have the assurance here, and I have not needed it myself, that we will have a fair hearing. That brings us, gentlemen, to recognize many of the shortcomings of these public utilities, not only in Wisconsin, which is a comparatively new State, but throughout all the States of the Union. I have been, as my associates know, for 25 years an earnest advocate of this public regulation. I have advocated the same general regulation that the State of Massachusetts has been blessed with these many years. It gave security to investments in this class of properties in Massachhsetts that was not enjoyed in any other State in the Union, and to-day the securities of this class of properties—I am speaking now of electric lighting, gas and street railway properties—have a value to this class of securities not enjoyed in any other section of the United States. That State takes up all of this class of investments offered. You do not find the securities of the public utilities of the State of Massachusetts hawked over the country, seeking buyers at bargain-counter prices. They know they are secure. They know that in Massachusetts there is no chance of a competing company coming in that can render your property subject, or subject you, to the

necessity of a combination at some time in the future on which double earnings must be made because of duplication of property. And that was the intent of this Wisconsin law of 1907, giving to this Railroad Commission the right to say what was a fair rate, and requiring those rates to be given to the public. That brings me, gentlemen, to my text. You know, as a general rule, a text is only made to appear to have something to talk on. I have seldon if ever heard a preacher that preached on the text that was announced to be discussed. But I am going to try to say something upon the proper maintenance of our properties, and one of the stipulations that I made when I reconciled myself to coming here and saying a few words to-night, was that I should not be expected to make a speech; for that I have never done in my life. I did agree that I would talk as though I had the heads of my various departments of the various companies that I administer, together, and were discussing with them the broad principles on which the properties that I administer are managed. I understand that there are here to-night about 90 per cent. of the membership of your Association, and that your Association has connected with it about 90 per cent. of all the Companies of the State. I happen to be associated with about 15 per cent. of all the Companies in your Association, and I find around me here 8 or 10 of the gentlemen who have frequently heard me discuss these same matters, and I propose to try to discuss them here to-night as I have always done before the companies that I am responsible for. I think, to begin with, gentlemen, in order to have that matter properly carried out, that your Association should undertake to formulate and have adopted by your various Companies throughout the State, a standard form of accounting on standard forms. I understand you have not got that. One of the first things I did in the electric lighting business, January 1st, 1884, was to call together the representatives of the few electric lighting companies there were in the country at that time – I speak of the Edison Companies more particularly – in the city of Harrisburg, Pa., and form what has since been one of the most effective trade organizations in this country, the Association of Edison Illuminating Companies. One of the first things that Association undertook to do and did do, and has followed ever since, was to formulate and promulgate a standard form of accounting which was adopted and has been followed in the 24 years since that time, very generally—a standard form of accounting. We cannot get together and we cannot make fair comparison of the results. You lose a part of the benefit that your organization would give to your various properties if you had a fairly uniform standard of accounting. I understand, of course, that local conditions in some cases may vary slightly what might be done. The character of a property may vary slightly. I speak advisedly when I say that very few gas companies in the State of Wisconsin have been administered with that degree of far-sightedness, conservatism or foresight, that almost any business man would exercise in the conduct of a private business. I am connected with 3 gas companies in the State, nearly every one of which in the last few years has had a very large amount of its property dissipated, which had to be entirely reproduced, without any fund having been accumulated in the earlier years of their existence with which to make good the ravages of wear and of time. The result is that we will have an argument some of these days, no doubt, with the honorable Railroad Commission as to what is a fair rate to be charged in those companies. I take the position that one of the first things the rate commission should recognize is that the present owners of some of these properties throughout the State had to buy a situation, as it were. The field was occupied by a company that had not been well managed, because if it had been well managed the first provisions it would have made would be for the wear and tear that was going on, notwithstanding it did not have to be made good that year or possibly for a series of years, but which in the long run must be made good. Like my good friend on the right here (Mr. Douglas), listening to this joyous outburst of some of these young men around here to-night, said: "Beggs, they don't realize they are putting forth energy to-night which in a few years they wish they had held, in some degreee at least, in reserve." [Laughter.] The time will come, gentlemen, when these lungs will not be so lusty, when the frame will not stand the same strain that you are putting upon it to-night. Only those of us who have passed through it and are now approaching the sunset see the tint across the hilltops and realize how well it would have been if in the years gone by we had husbanded a little more of that energy with which the Almighty endowed us. As I have said, three companies with which I am connected have been almost entirely reconstructed within the last 7 or 8 years. The property had to be paid for. It was making an apparent earning, and then new capital had to be injected into it. Now that new capital is there. When our good, dear brother, Prof. Pence, and his corps of valuers come around, they cannot see what we paid several hundred dollars for, and we will have to make a very logical argument to this Railroad Commission to convince them that there is value there which is not apparent and upon which we must be permitted to earn a dividend. And then we are up against the problem there that we have a peculiar position. We say we have got so much property upon which we must be permitted to earn a return, but upon which it is not fair to tax us; and that position is absolutely correct. We have had to buy, in many cases, a few streaks of rust, which were called mains underground, and some of them rails overground; and they have had to be replaced. They were not placed there with good engineering ability. It was not thought very important years ago. The engineer had not then attained the important position in our business that he occupies to-day. This replacement is going on all over the country. There is hardly a city to-day, where the gas company is managed with skill and ordinary intelligence, in which the company is not compelled almost to reconstruct the entire system, taking out 3-inch mains where we ought to have 6 or possibly 8-inch mains, and taking up the 6-inch mains and putting in 8-inch, 10-inch and 12-inch, and sometimes much larger mains. That is a dissipation of property, and we must make an argument that will be convincing to show that the advance of the art has made it necessary in order to give to the public this service which the Railroad Commission had a right to demand we do give them, and to compel us to give it to them. I believe in giving just the best service that is practicable, and I wish to distinguish between practicable and possible. The best service possible would bankrupt a great many of us, because you must take into account the difference between the possibilities – a seat for every passenger on the much abused street car is possible, but it is absolutely impracticable, from the commercial and the operative standpoint, and, therefore, I always distinguish between the practicable and the possible. I claim that a new gas company, or any other one of these utilities, when it starts out, should not delude itself with the idea that it has a perfect bonanza. These experts, like Prof. Bemis and some others – well meaning—tell how much or how little it costs to put a foot of gas into a holder. They ignore the many other expenses. Many of the owners of these properties originally deluded themselves in the same way. It only costs so much to put a foot of gas into the holder, and a certain small amount for distribution charges; the balance was profit. They did not realize the depreciation that was going on and which in the future must be taken care of. Now, I believe a proper method of accounting in a gas company requires that for every 1,000 feet of gas made you can set aside a certain amount to make good the wear that is going on. In other words, a maintenance reserve. And I desire to differentiate between maintenance and depreciation reserve. For instance, in one of our medium sized plants in this State 5 years ago, we were up against the proposition of renewing all the benches. The plant had been running for 3 years, and nothing had been set aside during that period. All had been going to profit; a fictitious profit. But the time came when that charge had to be met. Under my method of administration and accounting, I claim there should have been an account opened on the books of the company—different people may term it somewhat differently—for "bench repairs." In the plants for which I am responsible—four of them in this State, all medium sized – and among the larger sized cities, outside of the metropolis, we charge against operation and carry to "Bench Repairs," so headed on our ledger, 1 cent per 1,000 feet of gas made. We do not close that account at the end of the year for it is a continuing account, and when repairs are made on the benches in any one of those plants they are charged against that account. It does not make any difference when the repairs may be made for we always have a fair comparison, because the wear is going on just as much during the months when you are not making these repairs as during the months when they are being made. It is accruing. We have another account called "Works, Buildings, Repairs," and to that account we charge against operation, and carry to its credit every month, 1 cent for every 1,000 feet of gas made, and all the repairs of that character are charged against that account. Likewise, in "Works, Apparatus," we charge 1 cent per 1,000 feet of gas made and credit to the account, and as the repairs are made it is charged against that account. These are the three accounts in which we take the charge per 1,000 feet made, irrespective of how much is sold, because it is the making of the product that governs that factor.

Streets, Mains, Maintenance is a matter that is generally overlooked. I know there are eminent gas engineers, and men connected with them, who say a gas main is good for 100 years. I must take

that for granted, because I have not lived 100 years, and do not expect to reach that age in order to prove the fallacy of that claim; but I seriously doubt it. However, assume it does work for 100 years; when the 100 years comes around and your successor is there, have you created a fund for him to replace the main? Is that not a fair element to be set aside, however small the fraction is in every 1,000 feet of gas distributed through that main? It is a proper charge at this time. Therefore we charge 1 cent per 1,000 feet sold and carry it to "Street Main Maintenance" account. We carry the same amount (1 cent) for "Service Maintenance." We carry for "Meter Maintenance" 1 cent for every 1,000 feet sold.

Promotion of Business is a matter which various companies may choose to consider upon a different basis. We charge in our companies 4 cents per 1,000 feet sold to the "Promotion of Business" account, which includes all costs of advertising, and the various devices we may give away, or sell at less than they cost, to induce people to use gas. That is a matter which you can determine yourselves.

Legal Expenses—and the attorneys we always have with us—we charge ½ a cent per 1,000 feet and carry it to "Legal Expense" reserve. I never knew any of these gentlemen to forget to render a bill—pretty regularly, too. We pay it and charge it against that account.

Taxes.—Of course, the dear public ignores the matter of taxes. But nevertheless we charge 5 cents for every 1,000 feet of gas sold and carry it to our tax reserve, and that barely meets it. You, of course, understand that the size of the company or of your output may vary these figures slightly. I am discussing the broad, general principle of having these various accounts, and of charging certain amounts against them; then, in the course of a few years, you know what each charge will amount to, and there will not be a great deal of variation in the size of the fund required.

Injuries and Damages.—We carry 1 cent per 1,000 to the credit of injuries and damages account, charging it against operation. You might for a series of years accumulate a considerable fund under that head, but none of you will accumulate the fund that you ought to have. It is not necessary for me to attempt to recall to your minds the serious accidents that have occurred in connection with certain gas companies over this country. You recollect, possibly, one of the most notable, in the city of Boston, where an explosion in the subway entailed an expense of about $1,000,000 upon the Boston Gas Company. Should not that money have been accumulated in a series of years and been invested so as to form a fund to meet that contingency when it arose? Not that you must suspend dividends, or default upon your interest, or issue new capital for that purpose. You have no right to issue new capital with that object in view, and I take it that if you should make application to the Railroad Commission of Wisconsin to permit you to issue bonds to pay for injuries and damages, you would have a great deal of difficulty in convincing the Railroad Commission, and you should have sufficient difficulty to prevent you from doing it, because, being an expense incident to the business, it ought to be provided in advance. These accounts we do not close at the end of the year; they are continuous. You can never tell what an emergency may bring about.

Fire Insurance.—We carry to the credit of that account on our books 1 cent per 1,000 feet of gas sold, and out of which fund we pay fire insurance premiums and such losses as are not covered by fire insurance. Very few people can ever collect the amount of insurance which is sufficient to cover their money loss. We all carry a certain amount of the risk. For bad debts we carry ¼ cent per 1,000 feet sold to form a bad debt reserve, and all of the bad debts that we get during the course of the year we charge against that account. These matters do not include depreciation. I have not reached that point. These are maintenance accounts, and there is a difference between maintenance and depreciation. The maintenance accounts I have given aggregate 17¼ cents per 1,000 feet of gas sold. Now, there should be added to that an amount for a general depreciation reserve fund. To show you the importance of having this fund let me say that in one of the cities somewhere north of here I have had to repave a street, and, notwithstanding the fact that the pipes have not been down any great length of time, my superintendent tells me they are simply a shell of rust in that particular street, and he makes requisition for enough 6-inch pipe to replace that pipe. The cost of that replacement should be charged to depreciation reserve fund, and there ought to be such a fund to which to charge it. In many sections of a city the conditions change, the population changes, the use of gas increases, and it is necessary to take out, we will say, a 3 or 4-inch main to put in a larger one. The difference between the cost of the increased size and all that should go to depreciation. It is not creating new property, except with reference to the difference in the cost between a 6-inch main and a 3-inch main. I am only using these figures illustratively. You may apply them any way you see fit; but there should be a fund to charge that to. It is not proper to capitalize that; it is not fair to the consumer nor fair to your security holders. They both need protection. Your security holders should have the knowledge that there is enough being set aside month by month and year by year to safeguard their investment. They are taking it upon faith to a very great extent that these amounts are set aside. Therefore, you should set aside some amount per 1,000 feet of gas sold, dependent upon circumstances and conditions, that will create a depreciation reserve fund to take care of these amounts that are difficult to determine from year to year, and most of the accounts that I have referred to in a series of 4, 5, 6 or 7 years will be in such condition that you can readily ascertain whether one cent, or the fraction thereof, as the case may be, to which I have referred, is sufficient. If you find the amount too much it is easy enough to take off $\frac{1}{10}$, ¼ or ½ a cent, as the case may be, from an acconnt that is accumulating a fund too rapidly and add it to some other account. These are what I call expenditures necessary for the proper maintenance of your property from year to year. There should be a contingent fund. I desire to read in connection with this, an extract from a letter which I received April 26, 1908. It raises an entirely new question, and one which I do not know whether even the Honorable Railroad Commission in the multiplicity of its duties has had brought to its attention. It was a new thought to me, though it may not be to others. I refer to it because it is of such recent date—I am sometimes called a crank on this matter of proper provision for maintenance and depreciation. This letter is from quite a prominent gas man in the neighboring State of Iowa—I will not give either the name of the Company or name of the gentleman. He writes:

"Several months ago I was a witness for the .....Company, of Iowa, in an injunction proceeding brought by it against the city of ..... , to restrain the city from putting into effect an ordinance fixing the price of gas at 90 cents."

It is a fair sized city—I do not suppose that it would hurt to give the initials of the city—Cedar Rapids, Ia. [Laughter.] As it is a matter of injunction, a legal proceeding, upon which the courts have passed. I do not suppose I am divulging any secret. This gentleman was called as a witness. He says:

"Among the allowances which I claim should be made to capital employed in the gas business is an allowance to cover the cost of the reasonable worth of the protection to which the company's investment is entitled, against the hazards, physical, economic and social or political, to which it is exposed. Among the physical hazards I include the liability of the company for injuries to the persons of its employees and for injuries and damages to the persons or the property of the public. As the result of accidents the company is liable to have entered against it judgments for amounts exceeding the total value of its property, and the amount to which insurance might be carried by its stockholders is the value of the property employed for public use, less the amount of any mortgages thereon which might be liens preceding the judgment. In the Cedar Rapids case I showed that the cost to the Company for employer's and for public liability, under policies providing a total indemnity equal to the total value of the Company's property, minus the mortgages of such insurance would, if the Company made coal gas, be about 30 cents per 1,000 feet sold; if water gas were made, about 19 cents per 1,000 feet sold. Without making any further statements as to the showing and the reasoning given by me in justification of the Company's right to allowances for these and for other hazards, I may state that the court, so far as its decision reveals, thought it proper to make no allowance of any kind for any hazard of the business, physical, economical or other. The hearing was had in the State District Court, and perhaps an appeal will be taken to the State Supreme Court. I noted only this afternoon that the Milwaukee Electric Railway and Light Company is reported as making some charge of the nature I have indicated against the cost of its service. I should be extremely obliged if you will send to me a statement of your Company's practice in this regard, and also give me as full details as your time will allow."

Now, gentlemen, there is more force in that thought than may appear on its face. There is this risk to the investment. If we are only permitted to earn 5 or 6 per cent. on this class of properties, we will soon all be seeking Western farm mortgages, and not putting our

money into these enterprises to serve the public. No enterprise of this kind can hope to secure capital on a business with such risk attendant upon it as there is on this, that is not permitted to earn more than 5 or 6 per cent. I am here to claim that the rate earned by these properties ought to be anywhere from 8 to 12 per cent., to pay for the hazards. You can get 7 or 8 per cent. in many classes of investments, where there is no such risk. No manufacturing enterprise would think of limiting the profits to 5, 6 or 7 per cent. They usually want 10 to 20 per cent. They have been making it, and they do make it in a series of years, and this business is subject to much greater hazards than any of the others. We are subject to the whims and caprices of the public; yet I am one who believes that these public utilities are public servants. I believe in absolute uniformity of rates, and in the publicity of all of our accounts. I believe our books should be kept so that at all times any representative of the Railroad Commission should be welcomed to our accounting department, our books thrown open to him, and given to their accountants, not to be coached by ours, nor anything kept secret, but open them up. I am a believer in the very best service that is practicable, and I believe that you are on a surer road to get the proper recognition of the service rendered, under rate commission regulation, than without it, and that the rate commission will quiet much unjust clamor. It has already had that effect in this State. People feel they have a tribunal to whom they can appeal, that if rates are excessive, or discriminatory, they can be made uniform to the same class of customers using our commodities for the same purposes, in the same way in the same volume. The law recognizes that the business may be divided into classes. This is an important recognition. Now, then, gentlemen, the proper maintenance of our properties demands that they shall be kept up in much better shape than many of them have been in the past. They have not been creditable to the great business in which we are engaged, and they have been highly discreditable to the local managements many times. It is not a matter of pride. I do not believe that a property ever should be especially prepared for dress parade. I believe it should be on dress parade all the time. I do not believe that any company should be so operated that when the management, or those immediately in charge of it, gets wind that our dear, good brother, Prof. Burgess, or some of his associates, is going to make a test of the gas or the electric current in some particular city, immediately begin to boost up the quality of it. I do not suppose anybody in the State of Wisconsin would do that, although in some other States they might do it. I believe the service should be uniform all the time, and always in the same condition. If that were done we would be able to go before this Railroad Commission, when arguing for certain standards, when arguing to be permitted to advance some of these rates that must be done throughout the State, or to maintain others that will be attacked, and could show what we have been doing through a series of years – not weeks or months—and show that a firm, underlying principle of business had been pursued, that in order to give the best service to the public it is necessary that these properties shall be kept in the highest state of perfection and efficiency, that the best and latest devices should be acquired and employed, and that the companies should keep abreast with the advance of the art all the time. I think if this is done in this case there will soon be a different feeling in the community as to the attitude toward those charged with the administration of these public utilities. I can only say again, what I have said many times in the last year or two, that I have absolute faith in the honesty and intent of the Railroad Commission, and I am very glad indeed to have had Prof. Meyer, as Chairman of that Commission, announce here to-night, as freely and frankly and fully as he has, what will be the attitude of that Commission. I thank you, gentlemen, for your attention. I can only apologize for not having prepared these remarks so that they might be presented to you possibly in such manner as to have deserved closer attention, but I trust they will nevertheless justify you in giving some careful thought to the ideas offered. [Great applause.]

(To be Continued.)

One of the features of the meeting of the Iowa District Gas Association was given by the drill team of the Omaha Gas Company, illustrating the means and methods used to resuscitate persons overcome by gas or electric shocks. The regular team of the Company (5 in number) gave the drill on a raised platform, their interpretation of the application of first aid to the injured being extremely realistic.

The Hygiene of Burning Gas.

[Prepared for the Fourth Annual Meeting, Iowa District Gas Association, by Mr. J. C. Grey, Des Moines, Ia.]

We have been led to believe, since the first discovery of gas, that the burning of the same for illuminating purposes, heating or cooking, was accompanied by injurious effects on the health of occupants of the rooms in which it was burned. A great many authorities have proven conclusively that this is not the case, stating further that, when used properly, observing one or two of the simple principles of heat as applied to ventilation, we have by far the most hygienic fuel or illuminant procurable at the present time.

The supposed injurious effects produced by the burning of gas were, of course, caused by the poisoning or fouling of the air. This theory has been advanced without proof; in fact, the burning of gas not only does not vitiate the air but purifies it. The heat from the burner sets up a circulation in the atmosphere, and as the air passes through the heated portions the germs therein and particles of organic matter are destroyed, thereby purifying to a certain extent a part of the air. This heated air will rise to the ceiling and, if proper ventilators are provided, will immediately leave the room, allowing space for more fresh air, thus giving the gas burner further opportunity to aid in ventilating and purifying. If no ventilators are provided this heated air will diffuse through the ceiling or walls and windows in the upper part of the room, while the lower part will be constantly replenished by fresh air in the same way; this diffusion being made possible by the porous construction of all building material.

In order to deal with the different sides of this subject it will be necessary to review the chemical contents of air and the reaction produced by the combustion of gas. The atmosphere of the earth, commonly called air, consists essentially of the two elements, nitrogen and oxygen, in the proportion of 79 volumes of nitrogen to 21 volumes of oxygen, or by weight of 77 per cent. of nitrogen and 23 per cent. of oxygen. As enormous quantities of oxygen are constantly employed in the processes of respiration of animals, combustion and various kinds of decay, the question arises: Is the quantity of oxygen in the air decreasing? Chemists have estimated in recent years that in 3,800 years the decrease would not be more than 1 per cent., which is reassuring. Plants have the power of giving off oxygen, as in decomposing carbon dioxide. They utilize the carbon and a part of the oxygen, giving the air the remaining free oxygen, so in the process of vegetable growth we have a constant source of supply of oxygen. In the air, nitrogen serves the useful purpose of diluting the oxygen. Besides nitrogen and oxygen, we find traces of other bodies, some of which are water vapor, carbon dioxide and ammonia, with others that are local impurities. Not only is animal life dependent upon oxygen, but so also is combustion. Whenever there is fire or a luminous flame we find the oxygen being replaced by carbon dioxide. It is this production of carbon dioxide and its supposed effects that have been so grossly exaggerated. Carbon dioxide is a colorless gas, which at ordinary temperatures is not combustible, nor does it support combustion. It is not combustible, because it already holds in combination all the oxygen it has the power to deal with. Before it can burn it must first be decomposed. As has been stated, carbon dioxide is given off from the lungs just as it is from a fire. It is a waste product of the processes taking place in the animal body. Just as it cannot support combustion, so also it cannot support respiration. It is not poisonous any more than water is; but it is not able to supply the oxygen which is needed for breathing purposes, hence animals die when placed in it. They die by suffocation, very much as they do in drowning. Any considerable increase in the quantity of carbon dioxide in the air above that which is normally present – that is, 3 parts in 10,000 – is objectionable, for the reason that it decreases the proportion of oxygen in the air which is breathed. If, however, pure carbon dioxide is introduced into the air, it has been found that as much as 5 per cent. may be present without serious results to those who breathe it. In a badly ventilated room, in which a number of people are collected and lights are burning, it is well known that in a short time the air becomes foul and bad effects, such as headache, drowsiness, etc., are produced on the occupants of the room. These effects appear to be due, not to the carbon dioxide, but largely to other waste products which are given off from the lungs in the process of breathing.

This has been proven by experiments. Dr. Angus Smith conducted an experiment, in London, many years ago, in which he remained in an air tight room with a lighted candle until after the candle was extinguished for want of oxygen and suffered no ill effects. An analysis

of the air in this room was 229 parts of carbon dioxide to 10,000 parts. On the other hand Dr. Richardson proved that, after all carbon dioxide had been removed from a room, animals placed therein died in a short time, due to the organic matter produced by breathing.

The gases given off from the lungs consist of nitrogen, oxygen, carbon dioxide and water vapor. Besides these, however, there are many substances in small quantity, in a finely divided condition, which contain carbon, and are in a state of decomposition. These act as poisons, and they are the chief cause of the bad effects experienced in breathing air which is contaminated by the exhalation of the lungs. As carbon dioxide is given off from the lungs at the same time, the quantity of this gas present is proportional to the quantity of the organic impurities. Hence, by determining the quantity of carbon dioxide, it is possible to form an opinion as to whether the air of a room occupied by human beings is fit for use or not.

Since we have found that the burning of gas is accompanied by a chemical change, replacing the oxygen in the air by carbon dioxide, watery vapors, and traces of sulphuric acid, ammonia, etc., the first named being the principal product, the combustion of 1 cubic foot of gas producing approximately ½ cubic foot of carbon dioxide, and that the presence of carbon dioxide does not have any effect on the hygienic condition of the room, it remains only for the architect to devise a system of ventilation for each room that will permit a change of air sufficient for the needs of the occupants and lights. This should be compulsory in all rooms where human beings have to spend part of their time. A conduit should be placed near the ceiling, connecting with the chimney or outer air, so that the air will be constantly changing in the room as quickly as prevention of draughts will permit; living rooms, etc., requiring a more rapid change than sleeping rooms and others used for a limited time. The air should be changed in a room at least once an hour and increased according to the change of conditions. Practical experience, however, has shown us that in ordinary rooms 5 times is the maximum change without producing draughts. When such provisions have been made in rooms the burning of gas has proven a considerable aid in changing the air oy setting up a current of heated products toward the ceiling carrying with it the vitiated products of respiration. It is not necessary to have the gas burning at any particular position relative to the openings, as the ventilating efficiency is but a fraction less for a burner located 4 feet away from an opening than for one that is 2 feet. However, gas lamps placed above the breathing zone seem to give better satisfaction for ventilating purposes than side and table lights placed in this zone, as the heated air and products of combustion can pass directly to the ceiling and cause no discomfort to persons breathing in the room.

In order to install a ventilating system with sufficient capacity to insure pure air in a room it will be necessary to provide openings in the ceiling or upper part of room that will be sufficient to change the air in the room fast enough to provide pure air for as many people as are likely to occupy it for several succeeding hours. It has been determined that an adult requires a change of 1,000 cubic feet of air per hour. Taking this as a basis the size of the ventilators can very readily be determined, at the same time providing entrances for fresh air at or near the floor. In determining the size of ventilators to be used it is considered good practice to entirely neglect the gas lights, as the assistance to ventilation obtained by their use not only carries off any poisonous gas in the air but also all products of combustion that they produce.

Tests have been made in rooms with and without gas lighting. In the tests where no lighting was used in an occupied room there was a gradual increase in the carbon dioxide, the presence of which proves that other poisonous gases resulting from respiration are present, while in the gas lighted room there was a distinct decrease in the carbon dioxide, proving that gas lighting aids ventilation and can be neglected in designing the ventilating system.

Where gas is used continuously throughout the year for cooking purposes some provision should be made to carry off the products of combustion, as they are often of a poisonous nature, the conditions under which they are produced being somewhat different from those in gas lighting. When the burners on a gas range have been adjusted properly, a complete combustion of the fuel will be obtained and no flue connection of any kind will be needed, but as this is not generally the case I will try to explain why a flue is necessary. I believe, if the facts were known, that at least 90 per cent. of the gas stoves in use at the present time have at least one, if not more, burners out of adjustment. This condition is due to several causes, such as dirty burners, burners not in proper position, insufficient supply of gas and the wrong proportion of air caused by inexperienced hands changing the position of the air shutter, any of which will produce incomplete combustion, the products of which if not properly carried off will condense on the doors, windows and walls. Therefore, when equipping a kitchen with gas appliances to be used throughout the whole year, ample provision should be made for either direct or indirect flue connections. Of course in the summer months, when kitchens are usually open, this will not be necessary, but in the winter the doors and windows will be kept shut and some means must be provided for the escape of the poisonous fumes that may be produced. Direct flue connection from the oven burners has not proved satisfactory, for not only does it not take care of the waste gases from the top burners on the stove, but it sets up a draught that draws a considerable per cent. of the heat from the oven proper, that would otherwise be utilized, making its use far from economical. The direct flue might also be accompanied by a back draught which would be apt to smother the flame, causing accidents. If this connection be made direct with a chimney the moisture in the products of combustion may soften the chimney lining, causing it to peal off and clog up the pipes. Explosions result from either of the above.

A hood, placed about 36 inches above the top of a stove and connected with a chimney, an attic or the outside of the house, will undoubtedly provide the best ventilation for gas ranges, as the fumes from the oven as well as from the top burners will rise directly to the hood and be carried out of the room by the heated current of air set in motion by the burning gas. When the flames from a top burner strike the cool bottom of a vessel, because of a poorly adjusted burner or one that is too near the racks, we have gas burning in an insufficient supply of oxygen, the same as when a burner back-fires, and we get a partial combustion, forming carbon monoxide, which is a toxic poison, and acetylene, both of which should be removed from the room as quickly as possible. Gas range manufacturers cannot be too careful in placing their burners the proper distance below the racks, so that the Bunsen flames will not touch the vessel placed on the burner. If the flame is of sufficient length to touch the vessel it will be observed that there is a space directly underneath the vessel where no combustion is taking place or no flame is burning, and as the vessel becomes heated this space decreases, which is caused by the fact that the cold surface decreases the temperature and extinguishes the flame, giving us incomplete combustion as stated above. Another point brought forcibly to our minds is the necessity of making the top surface of the flue collar on all appliances corrugated or waved, so that if a vessel of any kind is set thereon the vent will not be entirely closed, causing a smothering of the flames, an explosion or incomplete combustion.

When installing a water heater, especially when placed in the bathroom, a flue connection should always be provided. This is necessary for several reasons. In the first place, the burner on the water heater is necessarily large, and even when adjusted as nearly correct as possible, to give the proper mixture of gas and air, the flame will come in contact with the cold coils and carbonic oxide, and acetylene will be given off, all caused by imperfect combustion. It is, therefore, necessary to have a flue connection to carry off these products. Bathrooms are usually small and are provided with little or no ventilation at the time the heater is being used, as all the heat that can be obtained is kept in the room, especially in cold weather. So if no flue connection is used the poisonous products from incomplete combustion will remain in the room and this condition is often followed by serious results. In placing this flue connection great care must be taken to prevent back draughts from the outside air, as a back draught very often smothers the flame. This can be prevented by placing a hood or cap at the outer end of the flue pipe. If possible a connection exhausting into an attic should be made, as this gives the best results. Dampers placed in the flue pipe assist in preventing back draughts, but it is a question whether this benefit offsets the chance that the damper may accidentally be closed, and if the pipe is dirty and clogged with soot the small openings in the damper will be obstructed, giving no ventilation whatsoever. This condition has often been followed by very serious accidents and at the present time a great many gas companies have discontinued their use. Of course, this can be avoided by keeping the flue pipe clean; but, as we all know, this is seldom done. The instantaneous water heater is more hygienic than the circulating, as the heated product of combustion, coming in contact with the water, destroys all germs therein, giving a purer bath water. However, the instantaneous heater uses a considerably larger amount of gas in unit

time, and the flue must be in good working order, as the increased combustion of gas will be followed by dangerous results if partial combustion is taking place and the poisonous products are not being carried directly from the room.

In late years gas has been used to a considerable extent in heating whole or parts of houses. This practice has been found very satisfactory when the heaters are constructed so that they will insure complete combustion of the gas, the ordinary ventilating facilities taking the place of a flue. Heaters should not be used that are equipped with a top opening for the escape of the heated air and products of combustion, as this sometimes results in serious accidents caused by the placing of a vessel over this opening, shutting off the supply of oxygen, giving partial combustion of the fuel with its accompanying poisonous gases. Incomplete combustion also takes place in heaters constructed with a plate above the flame, this plate yielding the same results as those found in gas ranges where the burner is too near the rack, only in this case the flame is allowed to strike the plate at all times.

Summing up the entire situation it would naturally follow that the united efforts of the architects and the gas men would improve the hygienic conditions to a vast extent in using gas for illumination, though, taking them as they are, there is no illuminant at the present time that can compete with the gas from an economical, hygienic or efficient standpoint, while the gas range will not completely fulfill all requirements until the time arrives when all ranges will be equipped with a hood and flue connection.

In preparing this paper, the writer first made a review of a number of papers written on this and similar subjects, a list of which will be given below for a reference to those interested in this topic. The chemical reactions referred to are substantiated by any authentic chemistry.

"Journal of Gas Lighting," Vol. 70, page 709, "The Loss of Heat by Buildings."
"Journal of Gas Lighting," Vol. 73, page 855, "Working of Ventilation Systems."
"Journal of Gas Lighting," Vol. 73, page 1427, "Aerial Sanitation" The Ideal Dwelling House.
"Journal of Gas Lighting," Vol. 75, page 268, "Ventilation without Draughts."
"Journal of Gas Lighting, Vol. 98, page 918, "The Use of Gas from a Hygienic Standpoint." Lewes.
"Journal of Gas Lighting," Vol. 100, page 423, "Gas Hygiene and Ventilation."
American Gas Light Journal, Vol. 84, page 578, "The Hygienic Effect of Lighting by Gas."
American Gas Light Journal, Vol. 74, page 882, "Gas and Hygiene."
" " " " Vol. 73, page 365, "Some Curious Tests of Air in a Room."
American Gas Light Journal, 83, page 371, "The Optical and Hygienic Value of Various Illuminants."
American Gas Light Journal, Vol. 72, page 92, "Moisture in Air of Rooms Heated by Gas."
American Gas Light Journal, Vol. 72, page 966, "Hygienic Effect of the Use of Gas."
American Gas Light Journal, Vol. 76, page 697, "A Scheme of Ventilation with Gas Warmed Air."
"Progressive Age," Vol. 17, page 64, "Necessity of Ventilation."
" " " 18, " 112, "Hygienic Lighting."
" " " 19, " 12, "Hygienic Artificial Illumination."

Address of the President (Mr. W. Doig Gibb), 1908 Session, The Institution of Gas Engineers, Great Britain.

Gentlemen—I appreciate to the fullest extent the honor which you have conferred on me by appointing me your President. As you are aware, the last appearance of your President for the time being is at this meeting—he having already taken part in the Institution's work during the preceding twelve months. With the knowledge of the responsibility for worthily upholding the traditions of the office, I started with considerable misgivings. The report of the Council will, I trust, show that much good work has been done during the period just past—work which, either finished or at least inaugurated, will raise the status of the Institution, and help forward the objects for which it exists.

If for no other reason, I am proud to be your President this year, in that I preside over a more complete Institution of Gas Engineers than has ever been before. The North British Association of Gas Managers is now amalgamated with us, and the Institution for the first time practically represents the entire industry. The happy meeting in Glasgow, when amalgamation was decided on, made me almost feel that the North British Association had, remembering I was a Scotsman, asked me to "accept this mark of friendship, warm, sincere." To again quote Burns, I trust that we may now all be "still closer knit in friendship's ties each passing year."

It is the common practice in presidential addresses to treat broadly the subjects with which the author has been more or less intimately connected, and I purpose to confine myself to a brief reference to several common subjects which have an interest to all of us. The annual meetings of gas engineers resemble, in one respect at least, the statutory meetings of prosperous companies, inasmuch as there is alway one satisfactory statement to make, and that is to record the continued progress of the industry. In spite of the rumors and alarms of byegone years, the consumption of gas still increases, and the only result of the dreadful prophecies seems to be that the acute people who did not believe in the prophets now hold shares in gas concerns which are much more valuable than when the believers in the false prophets disposed of them.

Field for Gas and Electricity.—Electric supply undertakings continue, with a few exceptions, to progress, and in some cases this has probably reduced the anticipated increases in gas consumption. But severe competition has not been without its benefits, since, as was pointed out by your ex-President, the public require a more liberal standard of illumination, and gas undertakings must now be conducted on strict commercial lines and the old conservative methods be eliminated. We do not at the present time so often meet with the misleading statements of our rivals in which the candle power of the latest and most efficient electric lamp is compared to that developed by a flat flame burner. The latest racing motor might as well be compared to Stephenson's "Puffing Billy," now enjoying a well-earned rest on a pedestal in a Northern railway station. Nor is there need to use such misleading statements, for if companies depended upon such, their business would have a short life. There is a field for electric supply companies, and I have no doubt they will increase and prosper as gas undertakings have done, and will do. In most of the business done by the latter, they are still without a rival in utility and price, and I do not anticipate quite such fierce competition in the future, in consequence of electricity losing its glamor and being now more often compared with gas in a logical and commercial way. When this is so, there is room for all, as there is still room for candles and lighting oils in spite of both gas and electricity. It is a matter for congratulation that, notwithstanding fierce competition and the lower individual consumptions of gas due to the introduction of incandescent burners, gas concerns have grown as they have done in past years. The growth should rather increase in the future, since, if incandescent lighting has not yet reached saturation point, it is at least a smaller factor towards reduction than it used to be.

Carbonization Questions.—A gratifying feature of the increase in gas consumption during recent years has been in the levelling of the load line. No longer are there such peaks and hollows; the filling up being no doubt largely due to the increasing use of gas for purposes other than lighting. The peaks, too, are either not growing or, at all events, are growing more slowly. This is a benefit, inasmuch as in many cases an increasing business is being done without the same necessity for spending capital which is, comparatively speaking, unremunerative, since the plant which it produces is only required for a short period in each year. But with it all, additions and new works are being constantly required, and never was there a time when the engineer who has to design such works is more puzzled to know what to do. Is he, for instance, to lay down horizontal retorts and find them obsolete before he has more than finished them, or is he to go in for some newer form and commit himself to a comparatively untried system, with the consequent risks of wasting his employers' money and of losing his own reputation? Fortunately, as regards various methods of retorting, the curtain may soon be lifted. I will not venture a premature opinion on the merits of various systems, in view of the facts that we are to have two papers read on two of the newest of these, that there is sure to be an interesting and instructive discussion on them, that we are going to Berlin to see the latest there, and that a committee of the Institution is at present engaged in investigation which, it is hoped, will tend to make the designing engineer's task more simple.

It is an inappropriate time, having regard to what I have just said,

to discuss the various types of charging and discharging machinery. We all hope for continuous carbonization, with as little auxiliary machinery as possible, and that little simple and reliable. What perhaps will be a feature common to all future carbonization systems is the application of outside producers. This is bound to simplify the construction of the retort settings, and the experience of those who have worked them is in their favor. As with everything else in a gas works, circumstances alter cases, and they are not so economical as the present ordinary small inside producers if they cannot be worked at, or nearly at, their full load – in other words, an outside producer should not be designed to supply fuel gas to more settings than can be conveniently treated as a unit in charging-up or in laying off.

Large Capacity Railway Wagons.—In designing new works, the engineer must remember, in laying out his railway lines, the comparatively harmless regulations recently made by the Home office. I say harmless because, though the first draft was a very formidable document, the strong opposition shown at the public inquiry held in 1905—and in which this Institution took part – has resulted in such general regulations as would have been observed by any gas engineer without the necessity for the intervention of the Government. A more important point to be remembered is the necessity for greater strength in the supports of overhead rails, the providing of greater side and head clearance, and the construction of wider curves with more adequate rail fastenings. These precautions are necessary, in order that the future works can handle high capacity trucks. These, to a certain extent, are being introduced; but it would appear to be impossible at the present time to get any definite information from the railway companies as to the ultimate capacity and design of the trucks for the future. But they are bound to be of a higher carrying capacity than the present small type, and there will consequently be a greater load on the rails and a greater spreading action on the curves. No doubt the railway companies are handicapped in the introduction of the larger trucks by the capital outstanding in their present stock, in present weighbridges and turntables, and by the opposition of traders whose private facilities for handling trucks are limited. But there can only be one conclusion formed from the following table:

Comparison of Low and High Capacity Trucks.

Capacity of Trucks. Tons.	Tare Weight. Tons.	Length Over all. Feet.	Paying Load.		Length of Train Carrying 500 Tons. Feet.	Engine Power Has to Move.	
			Per Cent.	Per Foot Run. Tons.		Dead Load Tons.	Paying Load. Tons.
10	6.26	19.5	62.11	0.512	975	313	500
20	8.75	23.0	69.56	0.869	575	219	500
40	16.00	41.0	71.42	0.975	513	200	500

From the above, it will readily be appreciated what the saving in traction costs to railway companies would be if the dead-weight load on every 500 tons of paying material moved could be reduced by 187 tons. The introduction of large capacity trucks will necessarily mean an increased axle load, with the consequent necessity for strengthening the supporting roads. I regret that, owing to the various designs of the high capacity trucks which are in use, and the want of any definite regulations on the subject, it is not possible to give any table of likely future axle loads and pitches. But it may safely be assumed that, even with the bogie system fitted to the larger and heavier trucks, the axle load may in the future be at least double what is at present the usual practice, and that the recurring greater axle loads may be at a shorter distance from one another than in the present rigid wheel base 2-axle trucks. It will also be obvious that more clearance is required on the sides of railway curves if trucks 41 feet long over all are to be employed, instead of the present ones of about 19 feet 6 inches.

It would be possible to say much more on other interesting points in gas works design, but time does not permit of my discussing and the approving of tar extractors, reversible condensers, mechanical washers, dry seal purifiers and spiral guided holders. The recovery of cyanide in one form or another is becoming common. It has probably been more difficult to get accurate information about this than about any other process in use in a gas works. I do not know whether this is due to fear that over-production might cause a serious fall in the price of an article in limited use, or only that the producers wished to be certain of their figures before making them public. At all events, I felt that a communication and a discussion on the subject might be useful, and my thanks are due to the gentleman who so willingly consented to read a paper on the subject at this meeting.

Recovery of Bye-Products.—It is impossible to read without great interest Herr Walther Feld's description of his "new method for the recovery of by-products from coal gas separately and in a concentrated form." I am not in a position to say whether he can do all he claims to be able to do, but a summary of his pamphlet makes very fascinating reading:

1. The cost of the plant will be 20 to 25 per cent. lower, and the space required less than one-fourth of that hitherto necessary.
2. The operations are simpler, can be more readily supervised, and require less control and fewer men.
3. Steam and power requirements are substantially less, as well as depreciation of plant.
4. The special washers employed render exhausting plant unnecessary, and, in consequence, the cost of plant and the working charges are considerably reduced, and this with increased efficiency and safety.
5. The tar is recovered in a homogeneous, uniform and anhydrous condition, and, consequently, difficulties with distillers are avoided.
6. Losses of cyanogen in the tar water are avoided.
7. Losses of ammonia in the tar, loss through imperfect washing out, and losses in distillation are all avoided. The yield in consequence is about 20 per cent. higher than before. Pure concentrated ammonia salt liquors are produced; no ammonia distillation plant is required, nor labor in connection with sulphuric acid. The recovered ammonia salts are free from free acid and are uncolored.
8. Losses of benzol in the tar are impossible; the regeneration of the benzol wash oils is almost avoided; the benzol distillation plant is less extensive, much more efficient, and can be worked continuously, and the benzol yield is higher, and the recovered products purer than before.
9. The requirements of water for cooling purposes are considerably less.

I can certainly vouch for the extremely ingenious special washer which he has designed to do most of the work. This machine will probably be of considerable service in ordinary gas purification and for the recovery of many by-products; and its use will help towards the ideal condition of continuous purification *in situ*.

Had time permitted, I should have liked to refer to the benefit of using cheap acid for the manufacture of sulphate of ammonia. By means of an arsenic extracting plant, an excellent color of ammonia salt can be obtained at a very small extra cost. A detailed description of the process may suffice for a paper at some future date. Up till now, no market has been found for the arsenic sulphide which is filtered off; but I only make this incomplete reference to the process in order to record the great assistance in this and other chemical questions which I have received from Mr. R. Forbes Carpenter, the Chief Inspector of Alkali Works, and Mr. J. W. Young, the District Inspector for the Northern District. While loyally fulfilling their duties, their desire seems to be, unlike that of some Government officials, to help the industries they are connected with by giving, often at considerable trouble to themselves, the benefit of their particular knowledge and wide experience.

Motor Vehicles for Gas Undertakings.—The great improvements made in recent years in the designs of commercial motor vehicles have made it possible to seriously consider their use in gas undertakings. The trials held by the Royal Automobile Club in September and October last were sufficient to prove their reliability; and though criticisms were not absent, these referred more to details than to any serious defects in what may be called the standard patterns. It would appear probable that for vehicles carrying up to 2 tons, internal combustion engines using petroleum spirit are the most reliable and economical; for those carrying 2 to 4 tons, either petrol or paraffine engines, or steam engines using paraffine as fuel; and for larger weight carriers, steam engines using coke or coal as fuel. In this latter class, it would seem to be more economical to employ a tractor and wagon than a self-contained vehicle, unless where the required speed is too high, or where the load has to be delivered in places where the tractor and wagon would be difficult to handle. My actual experience with such vehicles is as yet limited; but, as far as it goes, it is very satisfactory. A 10 to 12-horse power light delivery lorry, costing £320, has saved, when compared to horse haulage, £282 in the first 5½ months' work – and this after deducting driver's wages, cost of petrol, oil, repairs, and all incidental expenses. No doubt repairs will grow as time goes on, and depreciation should also be written off; but if such a vehicle saves its own cost in six months, there is a sufficient

margin left for these latter items. It must be remembered that the vehicle has been kept on the work which made the highest possible saving; but it is certain that where full loads have to be carried considerable distances without breaking bulk, a very great saving can be effected by displacing horse traction in favor of motor vehicles.

Coal and Coal Testing.—It will probably be expected that, as a resident in Newcastle, I should have something to say about coal. At all events, I am often asked about the relative values of Newcastle gas coal, and more especially as to whether coal is likely to rise or fall in price. As regards the latter point, I generally find that my questioners know far more about it than I do, and I will not therefore risk being considered a failure by giving any opinion about what the future price of our staple commodity is likely to be. As regards the relative values, my experience, when compared to other people's opinions and experiences, makes me more than ever believe in the truth of the adage that "one man's meat is another man's poison." But it is a matter of common knowledge that the seams of gas coal being worked around Newcastle are not what they were 20 years ago. The grand, clean 6-foot to 8-foot seams are all but worked out, and the thinner seams are being generally worked. I do not mean from this that Newcastle gas coal is not as good, in comparison with other coals now being worked, as it used to be. But, as I have said, the thinner seams are being worked, and it is impossible for the colliery owners, even with expensive cleaning plant and extra supervision, to supply such a uniform standard of coal as they formerly did. It is now therefore more important than it used to be to have some accurate method of testing the coals which are being delivered. It may be unfair to the coal vendor to make complaints based only on the appearance of the coal. It is certainly more satisfactory if such complaints can be substantiated by the production of test figures.

In a gas undertaking of any considerable size, it is, in my opinion, an absolute necessity to have an efficient coal-testing plant. By its intelligent use, a proper check can be kept on the coal being delivered, and much other useful information can be got to help the managers to run their works to the best advantage. The common laboratory plant which is in use is such as takes one-thousandth part of a ton as the standard testing quantity. Such a plant has, in my opinion, only one point in its favor, and that is the rapidity with which a result can be obtained. But my experience is that the results when obtained are of comparatively little value. In the business with which I am connected, there is such a small plant at each of the two works. The plants are modern, and in all essential features are similar to one another. It has been found that different tests of the same coal by the same plant give very varying results, and that it is not safe to place any reliance on a few tests, but only on an average of the figures obtained from a large number. Even when these average figures are got, they do not agree with the average figures obtained from tests of the same coal by the other plant. To some small extent, the variations in the quality of the coal may tend to produce these discordant results; but experience has shown that this is by no means the most important factor. To begin with, it is almost impossible to sample so that 2.24 pounds weight accurately represents the bulk of the coal, and this is shown not only in the gaseous results, but in the varying percentages of ash in the resultant cokes. Apart from sampling, the temperatures of the test retort and of the atmosphere surrounding the plant have much to do with the varying results. As regard the test retort, it would appear an easy matter to have the gas supply for heating this governed to a constant output; but in practice it is found that the age of the iron retort has much to do with the amount of gas required to heat it, in consequence of the conductive power of the iron decreasing with continued use. Even if accurate sampling be assumed, it therefore follows that while the use of one such small plant may be of some assistance to the management in forming an opinion on the relative values of the coals being handled, it does not follow that the figures got will either be such as are realized from working in bulk, or be comparable with those obtained from the same coal by another operator on a different plant. But, in my opinion, accurate sampling is impossible. No doubt a clean, uniform coal will, from its consistency, reduce the possible margin of error; but such coals are not now so common as they formerly were.

For an undertaking of any size, it would appear most desirable to have what may be called a full-size plant. Possibly the best combination would be a complete plant with settings of (say) one, three and six or eight retorts, with furnaces similar in construction to those in use on the regular works. If, in addition to this, a convenient section of the regular works can be isolated and accurate figures be readily obtained, so much the better. By the use of such a full-sized plant, the testing samples are so large as to eliminate any material error if proper care be exercised, and the testing is done in a way which much more nearly approximates to the regular routine. By its use the testing of the coke in the furnaces can also be carried out. It may be urged that the testing in such a plant would be a slow process. But a test can be done in 12 hours (6-hour clearing charge and 6-hour testing charge), and I should certainly place more reliance on the figures obtained than on the average of the 9 or 10 small tests which could be done in the same time. An important set of figures can be obtained from a full-sized plant which are quite inaccurate if got from a small one. Readings of the yield of gas can be taken at frequent intervals during the test, and a diagram prepared from them. If, at the same time, readings are taken from a jet photometer and a diagram prepared, much useful information can be gained as to which coal carbonizes most quickly, and at what period during carbonization the richest gas is given off. This information undoubtedly helps the manager in his working, and, if for no other reason, is valuable when the ordinary retorts have to be charged at more frequent intervals to tide over an extraordinary demand.

The plant is also useful for experimental work, and the general and intelligent use of such plants might result, for instance, in retaining the valuable naphthaline as a permanent gas and prevent further attempts to solve the question of getting rid of it as a nuisance. No great efforts have yet been made towards standardizing coal testing plants and their results. I was pleased recently to get a communication which showed that Holland was moving in the matter. At the present time the usual method of classifying the results of the tests of various coals is to arrange them according to the proportionate value they bear to a coal in the same district which is known to be of uniform and good quality. This method was advocated by Mr. G. P. Lishman, in a paper entitled "The Analytical Valuation of Gas Coals," read before the Institution of Mining Engineers. I have for some years carried out the same practice. But while such a method may be sufficient for local purposes, it is obviously an impossible one for any scheme of general standardization. It would appear that for this purpose a purely arbitrary set of figures will have to be determined. In leaving this subject, and in case any of my hearers think I have exaggerated the difficulties of proper sampling, I should like to refer them to the bulky volumes comprising the "Report on the Operations of the Coal Testing Plant of the United States Geological Survey, 1904."

The Coal Mines (Eight Hours) Bill.—In ordinary circumstances, I need not have taken up time by referring to a bill before Parliament and about which so much has been written. But the Coal Mines (Eight Hours) Bill has not yet become law, and it is impossible at the present time to pass the subject over without some reference to it. As you are aware, a deputation from our Institution waited upon the Home Secretary, and Sir George Livesey put the case of the gas undertakings to him in an able speech. Deputation after deputation has had the same tale to tell, and it appears as if there was reason to hope that, after all, the government are not to persevere in a measure which will have, if passed, such a detrimental effect on the well-being of the country. It seems extraordinary that a government should at any time press a measure to limit by law the hours of adult labor of a class which are, perhaps, better organized and better able to look after themselves than any other, and to do this at a time when general trade is so depressed, when employment cannot be found by vast numbers, and when so many social evils of long standing and great magnitude call for redress. Their plea is that the miners call for it. I only know the North of England, and I have taken considerable trouble, by conversation with the miners themselves, to ascertain their views. Many are against it; some think it will be all right; but none are enthusiastic. The statement often made, that the miners are unanimous in calling for the bill, is far from correct. Let me quote the Northumberland voting on the question. Of 28,725 voters, 10,688 did not vote, 9,251 voted for, and 8,786 voted against. As regards Durham, a miners' representative in Parliament said before a Home Office Committee appointed to investigate the question that, from a purely working man's point of view, a legal 8-hour day would be one of the greatest evils that ever came into the county of Durham. Even if the miners were unanimous, is it fair to legislate for the benefit of the few to the detriment of the many? For this is what it amounts to - a tax on all coal users for the benefit of a certain class. And this class has in the past shown itself fully able to look after its own interests without help from a government whose chief concern should be to hold the scales of justice straight.

High Pressure Distribution.—In many towns where the works are

shut in by the busier streets, it is becoming a very serious and expensive matter to lay new mains out from the works. The tendency seems to be to rather increase the initial pressure. I believe in high pressures, and would like to see all the extremities of the outlying mains in my district show a minimum pressure of 2 inches. This is required if gas fires, modern burners, and cookers, and gas engines are to be used to the best advantage. But in Newcastle this now entails, in the hours of heaviest consumption, such an initial pressure as to practically render quite useless one-third of the storage power, since the last lifts of the holders will not give the pressure required. To bring this lost storage into use again, I have experimentally laid down fans at one of the works, and from their satisfactory working it is probable that other sets will follow as required. The plant is in duplicate, and consists of two 56 B.H.P. gas engines driving two 30-kilowatt continuous current dynamos for 250 volts, the current from which drives two electric motors for 250 volts coupled direct to two straight line delivery fans; the necessary switchboards, automatic "no voltage" and "overload" releases, 200 ampere fuses, etc., being also in duplicate. By-pass gas connections are provided between the fan gas inlets and outlets. The engines have a normal speed of 210 revolutions per minute; the dynamos 900 revolutions. When a motor and fan is running at 2,750 revolutions, the brake horse power applied at the spindle of the fan is approximately 24; and this requires the engine to develop 35 B.H.P. At 3,100 revolutions, the relative figures are 35 and 47 B.H.P. I give below the guaranteed figures which were required for each single plant, as also the official test figures, since a comparison between the two is interesting from the fact that the guarantees were so easily fulfilled.

Test Figures.	Number of Revolutions of Motor and Fan Per Minute.	Amperes. To work to	Volts.	Delivery Per Hour. Cubic Feet.	Gas Pressure at Inlet of Fan. Inches.	Gas Pressure at Outlet of Fan. Inches
Guaranteed...	2,750	200	250	300,000	4 to 6	13¼
Actual.....	2,400	82	245	399,600	4	16

Note.—The controlling gear had to be such as would enable motors and fans to be driven at all speeds between 2,500 and 3,100 revolutions per minute. This was easily accomplished.

A few questions on what I have just said naturally suggest themselves. I have not found that the percentage of leakage has increased with increased pressures. There may have been a volumetric increase of leakage; but if so, it is counterbalanced by the percentage being calculated upon increased sales. The reason for adopting an electric drive was the necessity for having a balanced motor in consequence of the fans delivering direct into the distributing box of an adjacent governor house. A steam turbine drive would have done equally well; but the fans are not near to any suitable steam boilers in constant use, and as the fans will run at irregular intervals, and sometimes for only 1 hour in the 24, steam power could not have been so quickly brought into action or been so economical. The by-pass connections, in addition to their ordinary purpose of cutting out the fans for repairs, are also handy in starting the plant. They then stand open, and when the fans are first started the gas is churned round without going forward. A slow closing of the valves enables a very gradual extra pressure to be put on to the distributing box of the governor house. The fans give an ample pressure with a considerable reserve, and so are preferable to any positive machinery, because, being of the open type, any stoppage does not prevent the gas going forward at holder pressure, and there is no risk of causing such a vacuum behind them as would wreck a holder if it grounded with the machinery exhausting from it.

Automatic Street Lighting and Extinguishing.—An experiment with some 500 installations for street lighting and extinguishing by "pressure waves" from the governor house has been conducted for some time in a portion of the Newcastle district. No accurate data can yet be quoted; but everything goes to show that there is now reliable plant on the market to accomplish the desired end. With overloaded mains, it is certainly preferable that the method employed should be designed to work by increased pressures rather than by decreased ones. When only the gasholder pressure is available, overloaded mains, when working "increased pressure" plants, tend to prevent one source of saving, inasmuch as if the time of lighting up is cut too fine a sudden darkness, and consequent larger general consumption, may prevent the necessary extra pressure reaching the fitted lamps. With fans, or some such forcing machinery at hand, this can, of course, always be remedied.

Relative Hygienic Values of Gas and Electricity.—For many intricate and expensive investigations, the gas industry is indebted to the London Gas Companies. It will be known to most of my hearers that Dr. S. Rideal was recently employed by them to make a thorough investigation into the relative hygienic values of gas and electric lighting. The voluminous and most complete report which was the result has been published, and is procurable at a small cost. I can do no more than refer my audience to this book, in the belief that a careful study of it will result in much valuable information being acquired.

Training of Young Engineers.—Many more interesting subjects might be touched upon; but I must close with two which have a peculiar interest to me. I need not again go over ground covered by former expressions of my opinion in regard to the education of young men as gas engineers, unless to repeat my belief that the best man, and the one most likely to succeed, is the one who has had an engineering workshop training as well as a theoretical training and an experience in a gas works. In this connection, I am surprised at the claims of technical colleges that their so-called workshop training is as efficient as ordinary workshop practice. I have yet to see it, and I believe that a young engineer will learn more in a month in a proper "shop" than he will learn in a year in a college workshop. The report on the "Education and Training of Engineers," adopted by the Council of the Institution of Civil Engineers in 1906, contains a great deal of useful information, and as the report is really a concensus of the opinions of many well qualified to speak on the subject, I should be rash to criticize it in detail. But it should be remembered that a gas engineer's work probably embraces more than usually falls to the lot of a purely civil engineer, and that, in consequence, his best training may vary from that which is set out in the report. It is also not within the power of every young man to carry out such an expensive programme in equipping himself for the battle of life. But, given health, much can be done in a limited time if the necessary determination is there, and in one respect, it is better far for him than the more leisurely and expensive way, because he will have had one grand piece of training—the getting the better of the obstacles barring his way, which may serve him well in after life. Having regard to my interest in this subject, I felt compelled to accept the honor which your Council showed me when they nominated me as Examiner in Gas Engineering to the City and Guilds of London Institute (Department of Technology). But, in common with Mr. A. F. Browne, my predecessor, I believe it is not expedient for the same man to hold the office too long, but rather, by occasional changes, to vary the individualism of the Examiner in the interests of the students.

The Benevolent Fund.—You have all, I hope, seen this year's report of the Benevolent Fund Committee. The expenses of the year are more than the income; and this result is in spite of giving smaller grants than many of the cases called for. It will be noticed that much good has been done to the fund by the energectic efforts of Mr. Meiklejohn, and it is hoped that similar work will be done by friends of the fund among the members of the other Associations. Might I suggest that the various Associations should consider whether they could not each, from among themselves, form what I may call a Local Committee to press the claims of the fund among their members, and to assist the Committee in letting them know at once of any deserving case in their district, and also to supply information from time to time about local cases? If some such scheme could be carried out, more money would be available and greater justice could be done. There is certainly room for some such movement when it is realized that the total subscriptions to the fund for this last year are equal to an annual contribution from each member of 2s. 11d.

Already too long, I still must say a parting word of apology. My address is not deep—I did not intend it to be. I rather aimed at its being a light introduction to the more solid fare which is to follow, and, above all, I desired to avoid definite reference to any controversial subject, which, in my opinion, is best dealt with in a paper open to discussion.

TREASURER PRICE has announced a reduction in its selling rates for gas and electric currents sent out by the New Bedford (Mass.) Gas and Edison Light Company. The concession becomes effective the 1st prox. The exact rate on the gas reduction has been fixed, and it amounts to a cut of 5 cents per 1,000 on the gross—now $1 per 1,000—the usual concession of 10 cents per 1,000 remaining as before for prompt payment.

Decorating a Metal Ceiling.

A correspondent of the "Painters' Magazine," writing to that paper from Wausau, Wis., asked for information respecting a proper method of preparing a steel or galvanized iron ceiling for decorating, the affair to be finished in such a manner that the paint would not flake or pull off. He further wished to know about a good paint for such use. The authority quoted replied as follows:

Metal ceilings are usually prepared by the manufacturers, who give them a coat of dipping paint that dries hard enough to enable them to stack the sheets on top of one another and box them for transportation. This is done to keep them from rusting, and unless they are abrased in fastening them on the ceilings they need no other treatment before painting, but a good washing with naphtha to remove grease and dirt. When, however, sheet steel or galvanized metal has been put up without any previous preparation or shop coating, it is necessary to use a special priming in order to avoid the risk of peeling off the paint from the metal.

For galvanized metal apply the following solution before painting:

One ounce each of copper nitrate, copper chloride and sal ammoniac are dissolved in ¼ gallon of water, and when this is effected add 1 ounce of commercial or crude hydrochloric acid.

The solution must be made in an earthen or glass jar or bottle, not in tin cans or other metal.

Any druggist can furnish the ingredients or make the solution for it.

Apply to the metal with a soft brush and let stand for at least 12 hours, when a grayish film will have formed. Go over this with the duster, then go ahead with any good oil paint that you wish to use, and you need not apprehend any risk of peeling.

If the metal be sheet steel the best preparation is to remove grease or dirt with naphtha.

The first coat of paint should be semi-flat in order to have it adhere well.

A priming made from keg lead with any desired coloring matter, ground in oil, thinned with equal parts of coach japan, rubbing varnish and turpentine, will give the desired result.

Any other paint, glossy or flat, will adhere well to this coating.

Bureau of Information, The American Gas Institute.

BUREAU OF INFORMATION,
THE AMERICAN GAS INSTITUTE,
HEADQUARTERS, 716 LOCUST STREET, ST. LOUIS, MO.
W. A. BAEHR, Chairman.

Question No. XXVIII.—"Concerning the deterioration of diaphragms and metal parts.

"(a.) Do frequent changes in kinds of oil in the water gas machine directly or indirectly impair the diaphragms in consumers' meters?

"(b.) Would gas for a period of say 6 months, containing hydrogen sulphide or carbon bi-sulphide, to the amount of 5 grains per 100 cubic feet, damage the diaphragms and metal parts of consumers' meters to any considerable extent?

"(c.) Does vaporized hydrocarbon, or gasoline oil introduced into gas mains for the purpose of freeing them from naphthaline, have any bad effect on the diaphragms of consumers' gas meters, and how much?"

Question No. XXIX.—"Does very rapid condensation tend to reduce the permanent illuminating power of coal gas? Experience shows that the illuminating power of coal gas, when condensed very slowly, is considerably higher at the works than when the gas is condensed very rapidly. In the latter case, however, there is apparently much greater loss of illuminating power in distribution, especially in cold weather, due to the condensation of the heavier hydrocarbons. It is evident that it is possible to install gas condensing apparatus costing less than half what the approved apparatus costs, but in which the work would be done very rapidly, and also very efficiently so far as the use of cooling the water is concerned. Would the use of such apparatus result in an appreciable loss of illuminating power at the consumers' burners as compared with the use of the present approved types of apparatus?"

Question No. XXX.—"What is the relative value of inclosed and open 60-inch to 100-inch bar photometers?"

Items of Interest
FROM VARIOUS LOCALITIES.

MR. E. H. CORBETT has severed his connection with the Hallidie Machinery Company, of Seattle, Wash., in order to accept the responsible position of Manager of the new business department of the Portland (Ore.) Gas Company.

THE annual meeting of the Louisville (Ky.) Gas Company will be held at 10 A.M. to-day. The transfer books will be reopened to-day.

THE Public Service Commission for this district of New York city, has refused to give the backers of the Long Acre Electric Light and Power Company right to issue $10,000,000 capital stock and to emit $50,000,000 in bonds. The Company's present capitalization is $50,000 in stock and $500,000 in bonds. In refusing consent, Commissioner Maltbie remarked in connection with quite a bit of other cogent matter, or uttered the following sentences, which should be reassuring to those interested from an investment point in lighting shares of the Companies doing business on Manhattan Island:

"The applicant has not proved that the existing Companies are not properly conserving the public interest and convenience and that it would be to the advantage of the community to have a new company authorized to enter the field. If a competing company were allowed to begin operation it would not be likely that it would continue to operate independently for any considerable period." The truth and wisdom of these sentences may not be gainsaid.

"V. G.," writing from Topeka, Kas., under date of June 25th, incloses the following: "Last Saturday Judge Dana, of the local district court, refused to grant an injunction asked for by the local plumbing firm of Johnson & Beck to restrain the Consumers Light, Heat and Power Company, of Topeka, from enforcing certain rules and regulations regarding gas connections to buildings. In the testimony taken over the petition complainants alleged that the Company had 'pretended to enforce' certain rules for laying and connecting gas mains and pipes to buildings; that these rules and regulations were unreasonable and did not tend in any manner whatsoever to preserve the public welfare, health or safety, and had been adopted arbitrarily and attempted to be enforced by the Company without any regard for the convenience and economical construction of gas pipe connections and general equipment for the use of gas. This particular suit was instigated by the refusal of the Company to furnish gas to W. L. Osborne, whose residence, 1706 Kansas avenue, had been piped by the firm of Johnson & Beck. According to the petition filed in the case the Company refused to place a meter in the house, or turn the gas into the mains, claiming that its regulations had not been followed. Plaintiffs further claimed that such action on the part of the Company had caused irreparable damage to their business. The Osborne residence is a 5-room structure and the Company's service leading thereto from the main to the building line of the premises was 1¼-inch. At the Company's ending the plumbers took up the work but reduced it to 1 inch in diameter as to the 2 leads running to either end of the house. The regulations provide that the leads should be equal in diameter to that of its service. The Company was upheld at every point."

PRESIDENT FOOTE, of the Morristown (N. J.) Gas Company, is again trying to persuade the Common Council of Madison to grant his Company the right to distribute gas there—Madison adjoins Morristown directly to the East. It has been a long struggle to get this permission, for such has been asked for to the writer's knowledge for 20 years. The scheme was always non-suited, the objection being that Madison owns a municipally operated electric lighting plant. The last attempt, however, seems to have a fair chance of success, since Mr. Foote and associates are willing to agree that gas shall only be used for heating, cooking and power purposes. Why doesn't the Consolidated Gas Company, of New Jersey, try that plea on the religious people who own Ocean Grove, N. J.—also the Grove's electric lighting plant—where a like condition of affairs has existed for about an equal period of time.

THE Fidelity Gas Company, of Hoosick Falls, N. Y., has appointed Mr. F. A. Woohdead, of Philadelphia, Pa., to the position of Superintendent, vice Mr. Wm. P. Haynes, resigned.

THE Tax Department, of Milwaukee, Wis., has raised the assessment of the Milwaukee Gas Company's property for purposes of taxation in the sum of $100,000. Last year the valuation was $6,000,000; this year it is $6,100,000.

THE New Haven (Conn.) Company is well underway with the task of piping the streets of Milford, and the residents are taking good notice of the fact, too. Some of us in the Eastern territory are wondering whether Mr. Nettleton and his men will be able to put gas in the straw hat factory in Milford. The consensus of opinion in this regard decidedly favors Mr. Nettleton.—F."

"H. W. T.," writing from Auburn, Ind., under date of the 26th ult., says: "The De Kalb (Ills.) Fuel, Light and Power Company is giving a cooking demonstration at both the cities which we supply with artificial gas, this week at Auburn, Ind., and the week following at Garrett. The Misses Kolb, of Fort Wayne, Ind., are doing the work, and doing it in a highly efficient manner. Much interest is manifested by the housekeepers, and the lectures will undoubtedly result in much good to the consumers as well as to the Company. The business of this young Company is growing rapidly and the outlook is more than encouraging."

WE are in receipt of cards announcing the marriage of Miss Almena Penrose Milsted (daughter of Mr. Wm. N. Milsted, of the American Meter Company) to Dr. Alvah A. Fisher, on Monday, June 29, 1908, at Weehawken, N. J. Mr. and Mrs. Fisher will be at home, after the 10th inst., at their residence, 231 Broad street, Providence, R. I.

MR. JOSEPH WEEKS has been appointed Superintendent of the Lyons (Pa.) Gas Light Company, vice Mr. Jenks, whose appointment to a responsible position on the staff of the Providence (R. I.) Gas Company has been noted.

THE Decatur (Ala.) Light, Power and Fuel Company has arranged for an extension of its mains to and through the settlement of West New Decatur. The "routing" calls for the placing of not far from 10 miles of pipe.

THE comprehensive system of new construction and reconstruction now almost completed on the plant of the Chattanooga (Tenn.) Gas Company, will insure a proper supply of gas to that city for years. Mr. J. R. Hunting has taken up a permanent residence in the city, and will serve the Company in the important position of Commercial Director.

GOVERNOR GUILD, of Massachusetts, has reappointed Mr. Charles D. Jenkins, State Inspector of Gas Meters. His assistants are: Leslie E. Moore, of Newton, and Lawrence S. James, of Boston.

THE ultra-esthetic residents of the Flatbush section of Greater New York, made strenuous opposition to the proposal of the Flatbush Gas Company to construct a holder, up to retaining 3 million cubic feet, on a plot at the corner of Nostrand avenue and Winthrop street. They (the residents) held meeting after meeting in protest, at which much "inexpert testimony" was educed. For instance, one objector (he is a prominent practicing physician in Brooklyn) gave it as his positive opinion and belief that the holder and its contents would be a positive menace to the health of those whose residences were near it. A prominent preacher also thought the holder would be a positive blur on the beauty of the surroundings—at the point noted, Flatbush is as flat as a billiard table; in fact, old Flatbush was originally so named by a lot of Dutch farming emigrants who settled it in the 17th century, their inspiration coming from the vast area of absolutely flat land covered by dense growths of hickory, chestnut, beech and sassafrass trees, almost bound together at their bases by equally dense growths of berry bearing bushes. The objectors to the holders got no prospect of relief from their application to the authorities of the Brooklyn Borough, so they appealed to the Public Service Commission for the district, only to be met with the reply that the Commission had no jurisdiction. Yes; there's the old story about the lock up. The place needed one; that was agreed upon. But everybody wanted it on somebody else's street.

HERE is a pretty vivid set of figures indicating the growth of the Waltham (Mass.) Gas Light Company, whose Directors announced a fortnight or so ago that gas would be put at the dollar rate New Year Day:

Date.	Price per 1,000.
1875	$4.00
1876	3.70
1879	3.00
1881	2.70
1883	2.50
1885	2.00
1893	1.80
1894	1.62
1899	1.50
1901	1.35
1902	1.25
1905	1.15
1907	1.10
1908	1.05

Further, in 1876 the output of gas in Waltham was 8,667,000 cubic feet. In 1888, 30,256,000 cubic feet. For the next 10 years the output remained about stationary—it will be noted that the price was high—but in 1899 the increase again became marked, after which it increased by leaps and bounds. The output last calendar year was 89,945,000 cubic feet, and the management now declares that the output will at least reach the 100 million mark ere the first decade in the 20th century is reached.

THE new storage holder which is being constructed by Messrs. Deily & Fowler for the proprietors of the Petersburg (Va.) Gas Company is to be completed by October 1st. Its rated capacity is 250,000 cubic feet.

THE Houston (Tex.) City Council has adopted an ordinance declaring that after a certain date it shall be unlawful for anyone making and distributing artificial gas in that city to charge therefor the sum of $1.15 per 1,000 cubic feet, unless the bills for such use remain unpaid for a period of 10 days after the presentation thereof. In such case the Company may charge and collect at the rate of $1.25 per 1,000.

AMONG recent incorporations in this State one may find that of the Mohawk Power Company, of Glens Falls, N. Y., which was framed up for the purpose of manufacturing and supplying gas and electricity for light, heat and power, and to construct a dam across the Mohawk river in the counties of Schenectady, Albany, Saratoga, Montgomery, Herkimer and elsewhere. The initial capital stock is "adjusted" at $100,000, and the Directors are: Messrs. Eugene Ashley and E. J. West, of Glens Falls; Charles E. Parsons, Albany; Byron E. Morrow, of Schenectady, and P. F. Roohan, of Saratoga Springs.

A VERY odd case of asphyxiation from illuminating gas is reported from Benton Harbor, Mich. Mrs. Mary Murphy, while rocking her 18 months' old child to sleep in a cradle, dozed off. The cradle had "crept" some along the floor, and it is presumed that the cradle, just about the time Mrs. Murphy dozed, hit a gas cock on a pipe line running to a gas stove, with sufficient force to cause it to spring a leak. Strange to say, the child recovered. Discovery was not made for about 3 hours after the accident occurred.

AN important joint meeting of the First and Second Divisions of the New York Public Service Commission was held in the office of the latter, 154 Nassau street, New York, the afternoon of the 24th ult. The session was held to hear arguments for and against the promulgation of a uniform system of classification of the accounts of gas and electric companies.

THE authorities of Portland, Me., are considering the advisability of substituting lamps of the Welsbach pattern for electric arc lights in the lighting of the streets of that city.

SECRETARY H. A. FERRANDOU has notified the shareholders of the New Orleans (La.) Gas Light Company that the regular semi-annual dividend of $3 per share has been declared, payable the 15th inst.

AT a special meeting of the shareholders in the Suburban Gas Company, of Philadelphia, held the last week in June, it was voted to merge with the Nether Gas Company, without change of name. The Nether concern was not actually engaged in gas manufacture, but it was the owner of several franchises for tentative gas works operations in Delaware county, Pa., which now become the property of the Suburban Company.

THE AMERICAN GAS LIGHT JOURNAL

MONDAY, JULY 6, 1908.

The Market for Gas Securities.

Consolidated opened this morning (Thursday) at 124 to 125. About noon the ticker carried the news that Justice Erlanger, of the Supreme Court, sustained the demurrer interposed by counsel for Consolidated Gas Company, in the annulment proceedings instituted by Attorney-General Jackson for the State. We thought Jackson would be jacked up a bit, but were not prepared for the thoroughly good hoisting that was given to him and to his brief. When the opinion became known Consolidated made an advance of 2½ points in the bid price.

Brooklyn Union is steady at 110 to 120, with quite a bit of inquiry for its bonds. Peoples, of Chicago, is going on to the par mark, which it will easily reach by September 1st.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

JULY 6.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid*	*Asked.*
Consolidated	$73,177,000	100	123½	124⅛
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	3,000,000	1,000	92	97
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual	3,500,000	100	130	160
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	92	96
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98	104
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	100	105
Con. 5's, due 1945, J. & J.	1,500,000	—	97	101
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	90	98
Standard	5,000,000	100	70	100
Preferred	5,000,000	100	100	125
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	110	120
1st Con. 5's, due 1948, M. & N.	15,000,000	—	91½	92
Yonkers	999,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	1	1 1-16
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
" " Bonds, 5's	a.250,000	1,000	63	66
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,000,000	1,000	104	106½
Cincinnati Gas and Electric				
Co.	29,500,000	100	88½	89
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	98	98
Columbus (O.) Gas Lt. &				
Heating Co.	1,682,750	100	87	88
Preferred	3,026,500	100	81	84
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	—	105
Mortgages, 6's	3,600,000	—	—	118
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,400,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	—	—	74½	75
Detroit City Gas Co.	6,000,000	50	—	50
" Prior Lien 5's	4,618,000	1,000	—	98
Detroit Gas Co., 5's	381,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co.,				
Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
ort Wayne	2,000,000	—	—	—
' Bonds	2,000,000	—	55	—
Grand Rapids Gas Lt. Co.,				
1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	100	105
" Bonds, 5's	10,500,000	—	101	102½
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	10	92	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	—	100
Preferred	2,500,000	100	60	70
Bonds	10,000,000	1,000	104	104¼
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,370,000	50	143	145
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip,				
due 1910	100,000	25	60	60½
Massachusetts Gas Companies, of Boston	25,000,000	100	52¾	53
Preferred	25,000,000	100	85	85½
Montreal, Canada	2,000,000	100	218	218¾
Nashville Gas Lt. Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	92	92½
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Elec. Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
San Francisco, Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	751,000	1,000	92	—
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	96¼	—
Syracuse, N. Y.	1,378,000	100	50	55
Bonds	2,047,000	1,000	102	—
Washington, D. C.	2,600,000	20	345	355
1st Mortgage, 6's	600,000	—	—	—
Western, Milwaukee	4,000,000	—	—	—
Wilmington, Del.	600,000	50	230	—

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO., N. W. CORNER BROAD AND ARCH STS., PHILADELPHIA, PA., June 10, 1908.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable July 15th, 1908, to stockholders of record at the close of business, June 30, 1908. Checks will be mailed.

1723-5 LEWIS LILLIE, Treasurer.

Position Wanted

As Superintendent of Coal or Water Gas Plant.

Understands heats and purifying thoroughly. Thirty-nine years old; 20 years with one company. A-1 references. Correspondence solicited.

1725-2 Address, "N. M. H.," care this Journal.

PRACTICAL GAS SUPERINTENDENT

Desires Permanent Position with Medium or Small Gas Company as Manager or Superintendent.

Qualified to take entire charge of both coal and water gas properties. Clean record. Twenty-five years' experience.

1726-4 Address, "D. H. H.," care this Journal.

Position Wanted

As Manager or Superintendent of Gas Company.

Am well versed in both the construction and operation of coal and water gas works. Can give the best of references.

1725-2 Address "C. D. E.," care this Journal.

Position Wanted.

Married man desires position as superintendent of small coal or water gas plant.

Address, "COAL OR WATER GAS,"

1726-1 Care this Journal.

WANTED.

Position as Manager, Superintendent or Engineer.

A young married man, who has had nine (9) years' practical experience in office systems, distribution, operation and construction of both coal and water gas properties. Prefers in city of 20,000 to 50,000 population either North or South. Party is a draughtsman and can handle transit and leveling idstruments.

1726-3 Address, "XOR," care this Journal.

Situation Wanted.

Young man, 30 years of age, and of 12 years' practical experience in gas manufacture and distribution, wishes situation as engineer or superintendent of a gas company where expert services are required and the output is at least 50,000 per day. Is graduate engineer and at present superintendent of one of the largest high pressure plants in the U. S. The best of references and experience only.

1726-2 Address, "S. R. U.," care this Journal.

WANTED,

A Superintendent for a Small Coal Gas Plant

In town of 13,000 inhabitants, in Mississippi. Must have had experience with mains as well as retort house. Furnish reference.

1724-2 Address, "MISSISSIPPI," care this Journal.

WANTED,

FOREMAN.

For New England water gas plant with send-out of 60,000,000 cubic feet.

Address, "NEW ENGLAND,"

1725-tf Care this Journal.

WANTED,

A Gas Maker

On a 4-foot water gas set Address,

1726-1 GLEN COVE GAS CO., Glen Cove, L. I.

FOR SALE,

One 7-foot American Meter Co. Station Meter, with 12-inch connections. The meter was built in 1896, and is in first-class condition.

Three Cast Iron Purifying Boxes, 21 feet by 21 feet by 4 feet deep; seal, 30 inches deep.

One Traveling Crane (track on floor), with oil pump and fittings complete, and 12-inch pipe, valves and fittings for a 3-box system complete.

Address, GEO. LIGHT,

1715-tf DAYTON, O.

TO GAS MANAGERS.

We have Forty-five 5-Inch Kirkwood Boiler Burners, Twenty-one 5-Inch and Eight 3-Inch Gwynn Burners, for Sale.

These burners have been used a few months, but are in perfect working condition. Will sell at a bargain.

1725-4 CHEMUNG CO. GAS CO., Elmira, N.Y.

Utilize Your Gas Liquor.

NO EXTRA LABOR OR OPERATING EXPENSES.

IMPROVED AMMONIA CONCENTRATOR.

About 100 in use. Write to

STROH & OSIUS, Patentees, or

MICHIGAN AMMONIA WORKS, - Detroit, Mich.

FIELD'S ANALYSIS FOR THE YEAR 1907.

An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland; being the 39th year of publication. Compiled and arranged by JOHN W. FIELD, Sec'y and Gen. Mgr. of The Gas Light and Coke Company, London. Price, $5. For Sale by

A. M. CALLENDER & CO., 42 Pine St., New York City.

HOW'S YOUR METER'S LUNGS?

INLET AT TOP.

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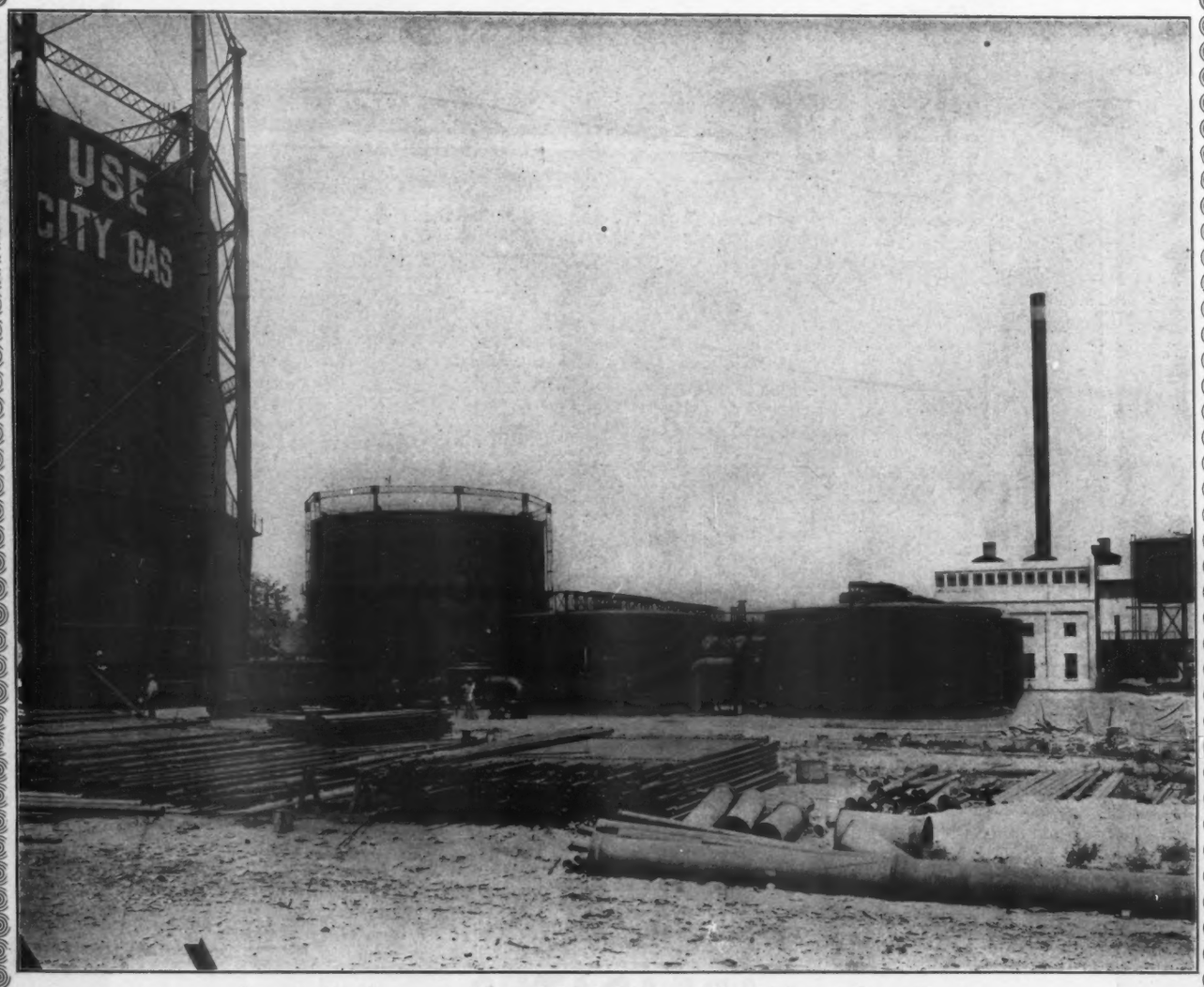

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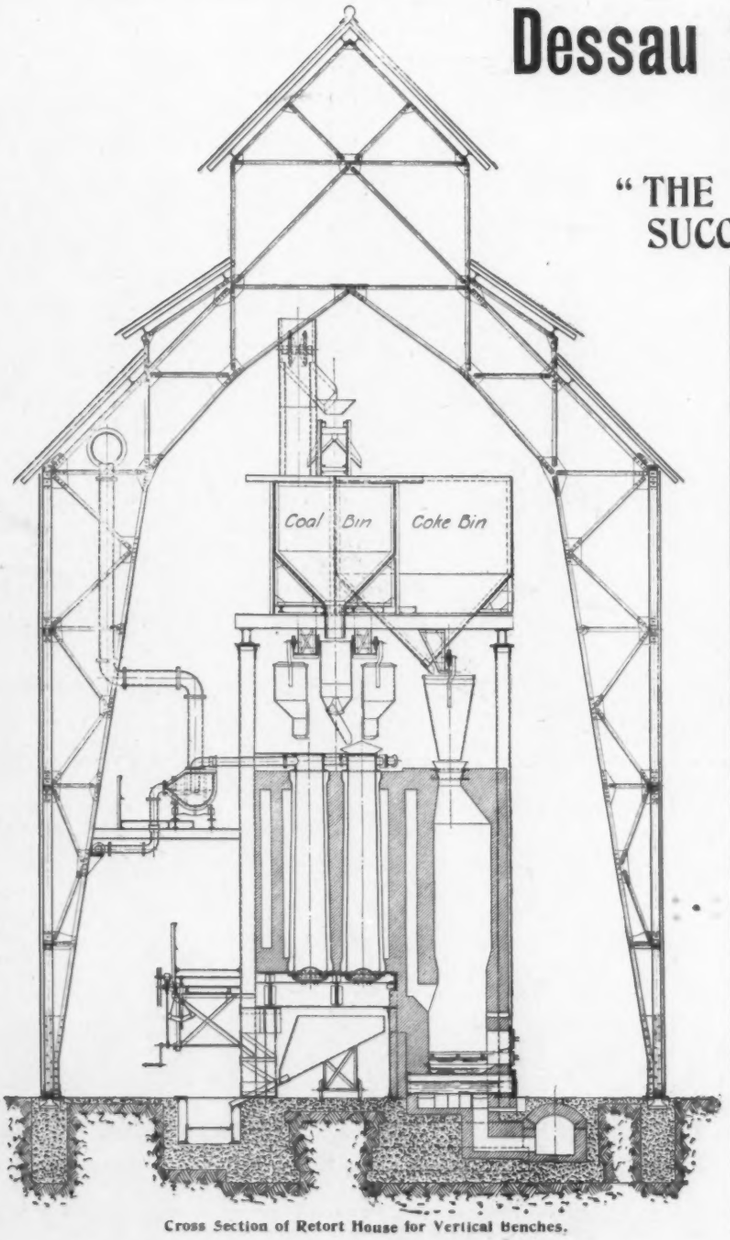

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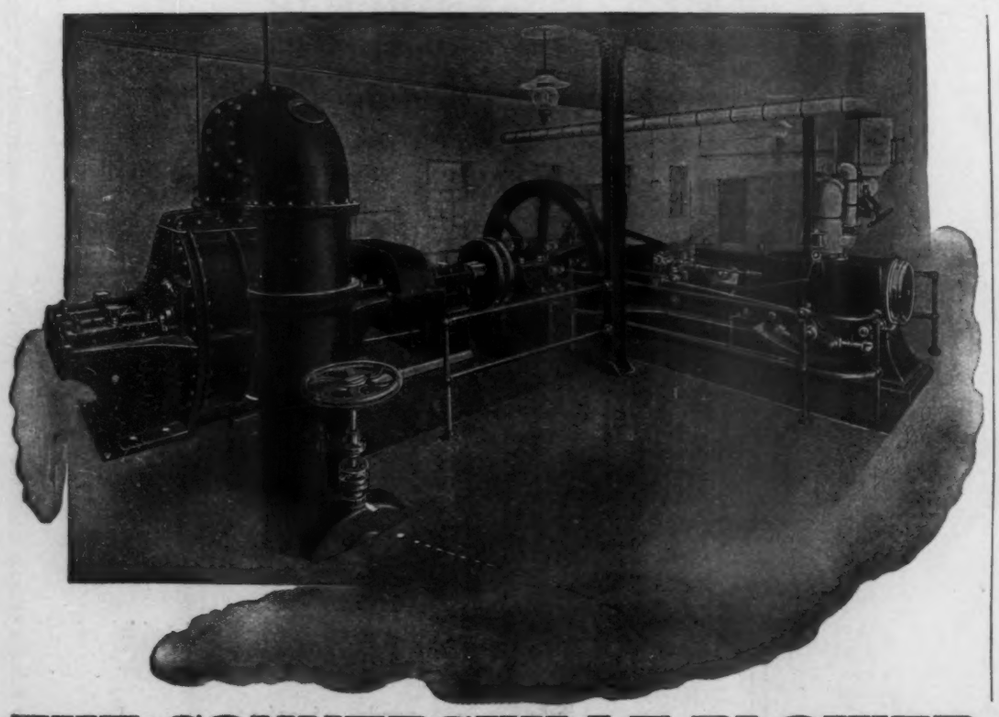

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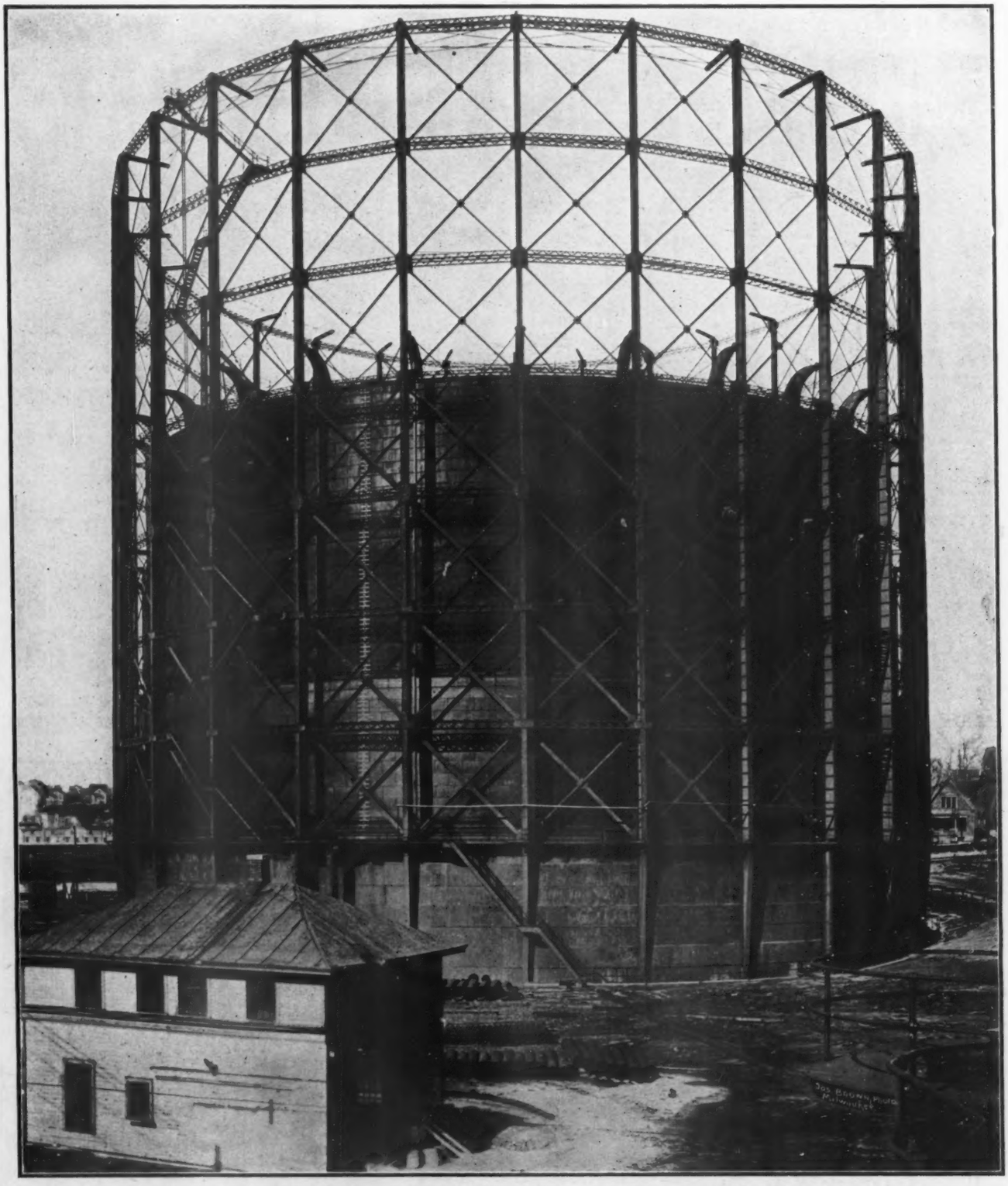

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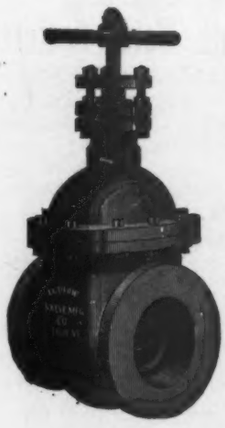

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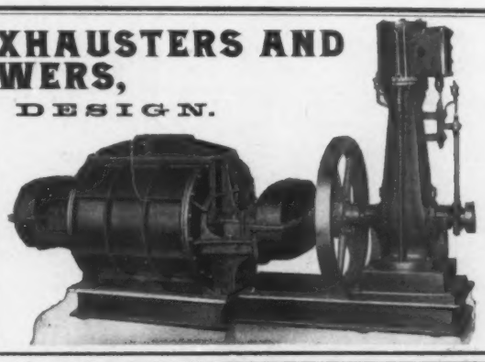

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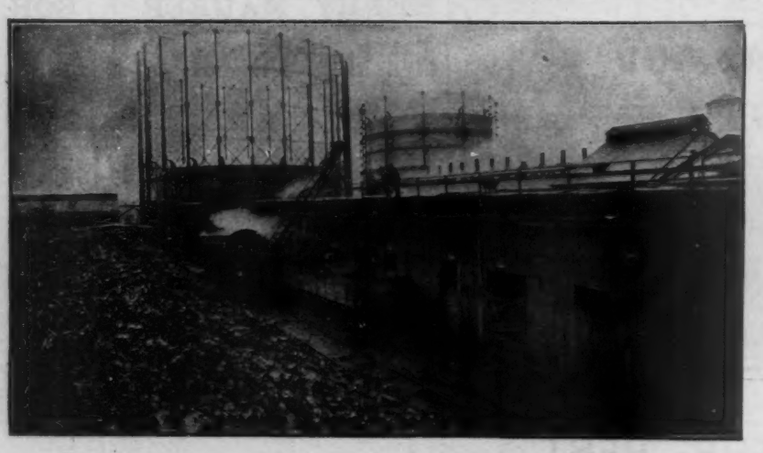

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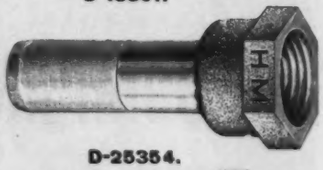

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PUBLIC LIGHTING TABLE.

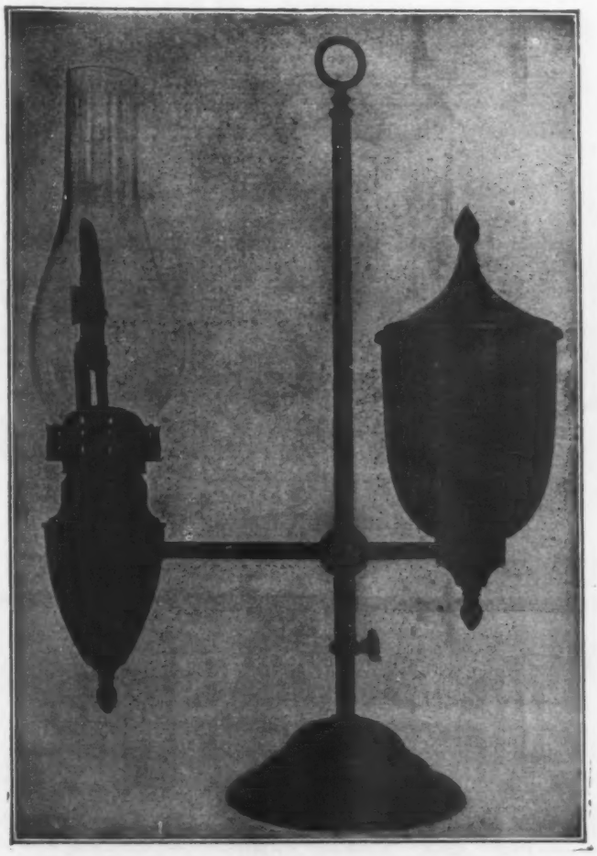
JULY, 1908.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.
Wed.	1	8.00 PM	3.30 AM
Thu.	2	8.00	3.30
Fri.	3	9.50	3.30
Sat.	4	10.20	3.30
Sun.	5	10.40	3.40
Mon.	6	11.10 FQ	3.40
Tue.	7	11 40	3.40
Wed.	8	12.10 AM	3.40
Thu.	9	12.40	3.40
Fri.	10	1.20	3.40
Sat.	11	2.10	3.40
Sun.	12	No L.	No L.
Mon.	13	No L FM	No L.
Tue.	14	No L.	No L.
Wed.	15	8.00 PM	10.20 PM
Thu.	16	8.00	10.50
Fri.	17	8.00	11.30
Sat.	18	8.00	12.00
Sun.	19	7.50	12.30 AM
Mon.	20	7.50 LQ	1.00
Tue.	21	7.50	1.30
Wed.	22	7.50	2.00
Thu.	23	7 50	2.40
Fri.	24	7.50	3.50
Sat.	25	7.50	3.50
Sun.	26	7.50	4.00
Mon.	27	7.50 NM	4.00
Tue.	28	7.50	4.00
Wed.	29	7.50	4.00
Thu.	30	7.50	4.00
Fri.	31	7.50	4.00

TOTAL HOURS DURING 1908.

By Table No. 1.

	Hrs.Min.
January	228.30
February	187.30
March	192.00
April	160.10
May	155.10
June	138.00
July	155.50
August	173.40
September	185.20
October	214.00
November	218.10
December	226.40
Total, yr.	2235.00



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10-Candle Power.

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This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

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2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

JULY, 1908.

Day of Week.	Date.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Complete Lighting in One Hour	Complete Extinguishing in 50 Minutes
		From Time Given	
		P. M.	A. M.
Wed.	1	7.27	3.07
Thu.	2	7.22	3.07
Fri.	3	7.22	3.07
Sat.	4	7.22	3.07
Sun.	5	7.22	3.07
Mon.	6	7.22	3.07
Tue.	7	7.22	3.07
Wed.	8	7.22	3.07
Thu.	9	7.17	3.12
Fri.	10	7.17	3.12
Sat.	11	7.17	3.12
Sun.	12	7.17	3.12
Mon.	13	7.17	3.12
Tue.	14	7.17	3.12
Wed.	15	7.17	3.12
Thu.	16	7.12	3.17
Fri.	17	7.12	3.17
Sat.	18	7.12	3.17
Sun.	19	7.12	3.17
Mon.	20	7.12	3.17
Tue.	21	7.12	3.17
Wed.	22	7.12	3.17
Thu.	23	7.07	3.22
Fri.	24	7.07	3.22
Sat.	25	7.07	3.22
Sun.	26	7.07	3 22
Mon.	27	7.07	3.22
Tue.	28	7.07	3.22
Wed.	29	7.07	3.22
Thu.	30	7.02	3.27
Fri.	31	7.02	3.27

TOTAL HOURS DURING 1908.

	Hrs.Min.
January	481.50
February	329.15
March	351.50
April	341.50
May	233.05
June	218.10
July	282.55
August	254.55
September	292.25
October	420.45
November	374.30
December	411.05
	3992.35
Deduct on account of 50 min. extinguishing time	30.30
Total, yr.	3962.05

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Package Contains 16 Dozen.

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Augusta, Me. (2d contract).
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Jenkintown, Pa. (2d contract).
Coney Island, N. Y.
Mexico, Mo.
Jacksonville, Fla.
Syracuse, N. Y. (2d contract).
Atlanta, Ga. (2d contract).
Holyoke, Mass.
Peoria, Ills.
Schenectady, N. Y. (2d contract).
Danbury, Conn.
Galveston, Tex. (2d contract).
Quebec, Canada.
Indianapolis, Ind. (2d contract).
Bessemer, Ala.
Waterbury, Conn. (5th contract).
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New Hartford, Conn.
Poughkeepsie, N.Y. (2d contract).
Nashville, Tenn.
Salisbury, Md.
Norfolk, Va. (4th contract).
Wallingford, Conn.
Richmond, Va. (2d contract).
Oak Bluffs, Mass.
Arlington, Mass.

TOTAL SETS INSTALLED DURING YEAR, ... 43
TOTAL SETS INSTALLED TO DECEMBER 31, 1907, ... 677
TOTAL DAILY CAPACITY, TO DECEMBER 31, 1907, ... 545,865,000 cu. ft.

Tar Extractors for Carburetted Water Gas.
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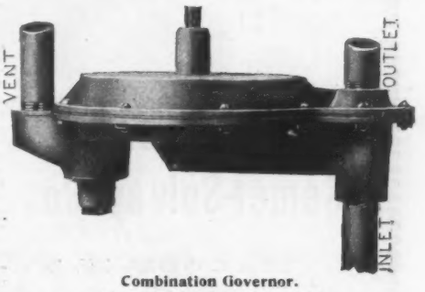

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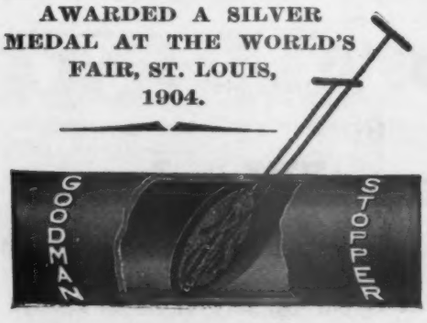

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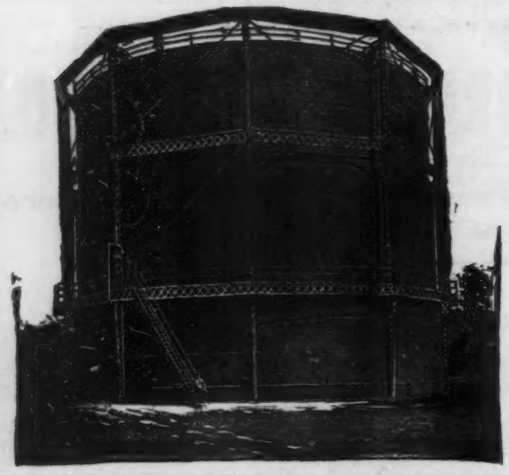

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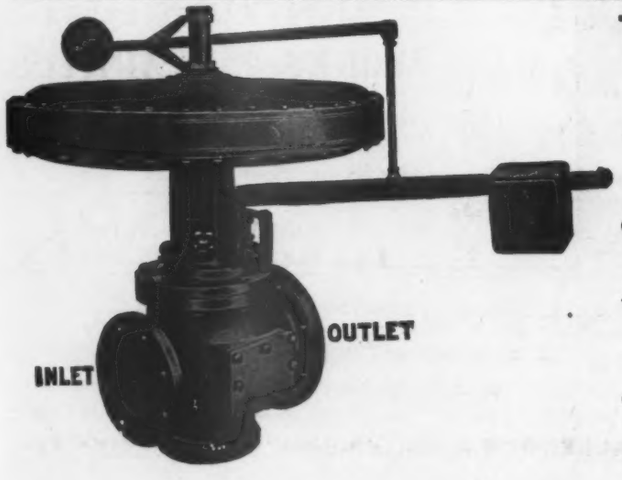

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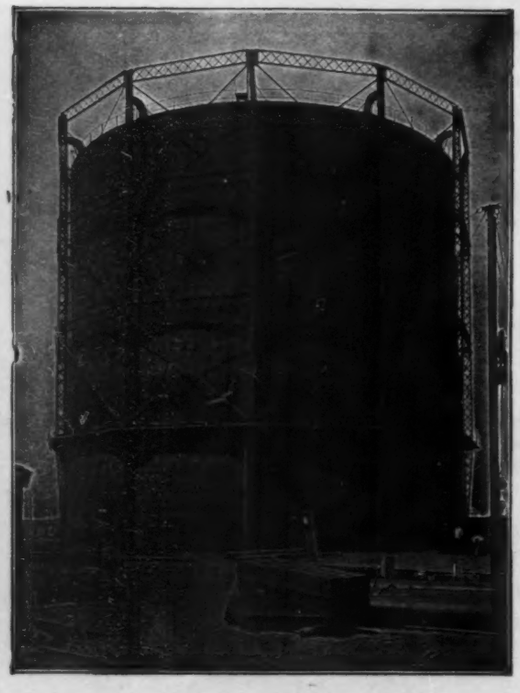

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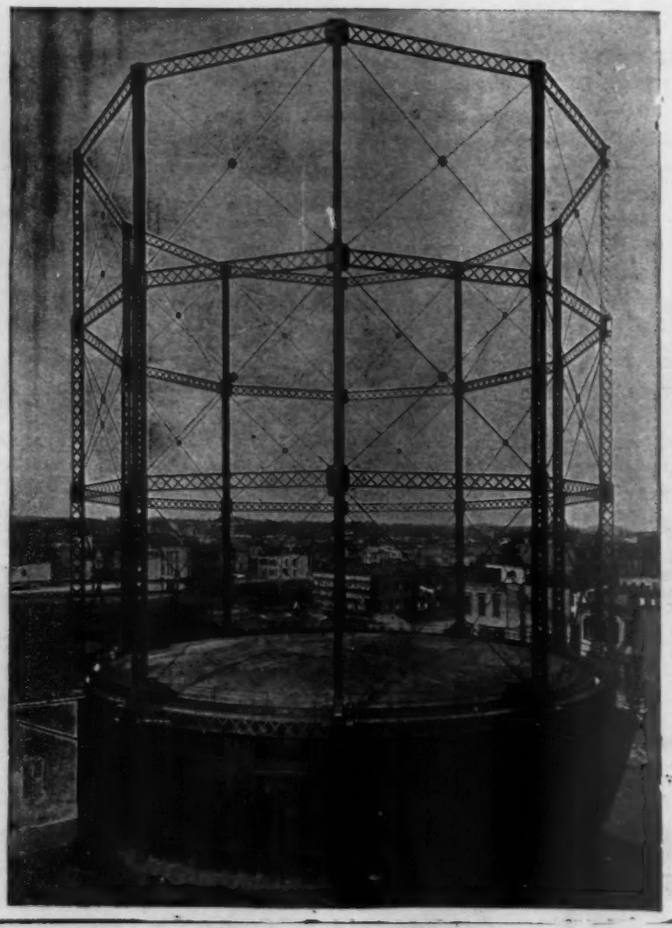

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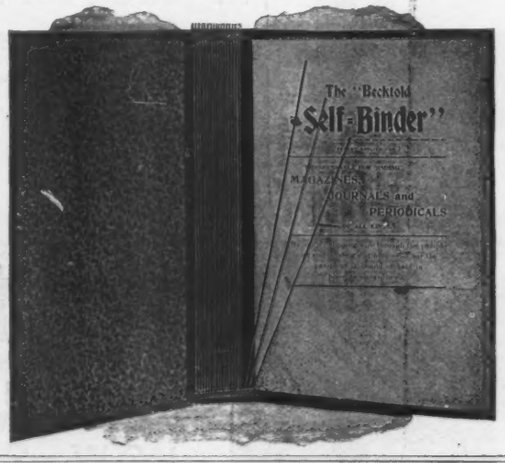

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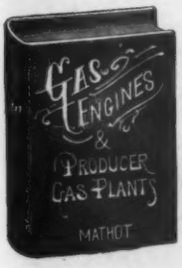

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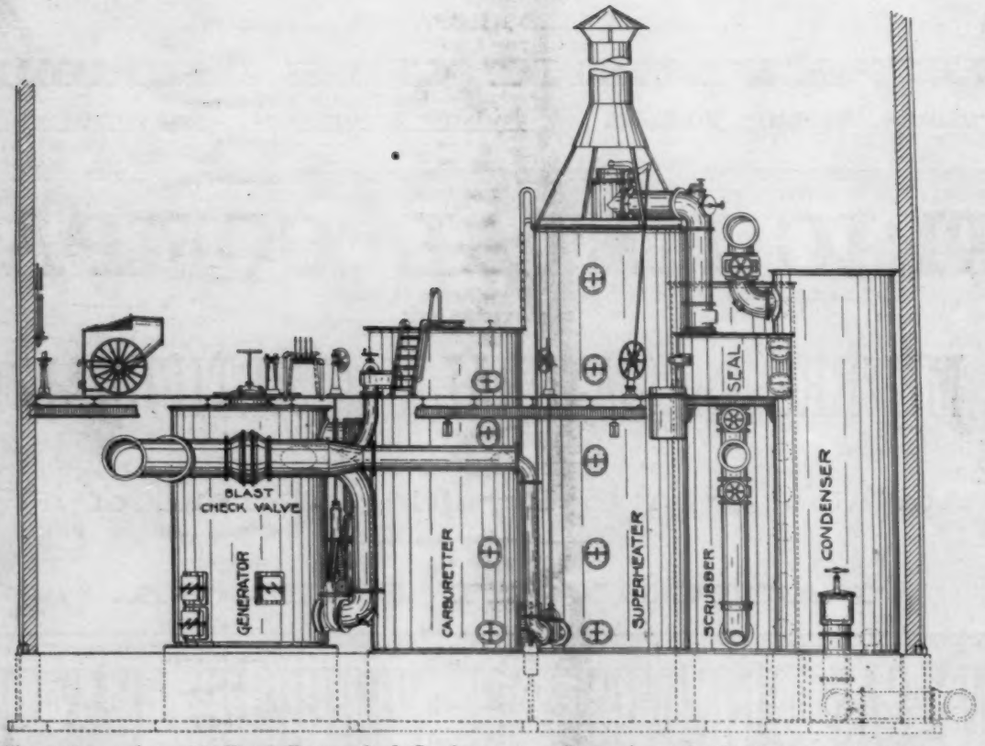

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